

2004 - 2005



Annual Salmon, Steelhead And Char Report: WRIA 10 Puyallup/White River Watershed



Puyallup Tribal Fisheries

August 2005

2004 - 2005

Annual Salmon, Steelhead And Char Report:

**WRIA 10
Puyallup/White River Watershed**

August 2004 - June 2005

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August 2005

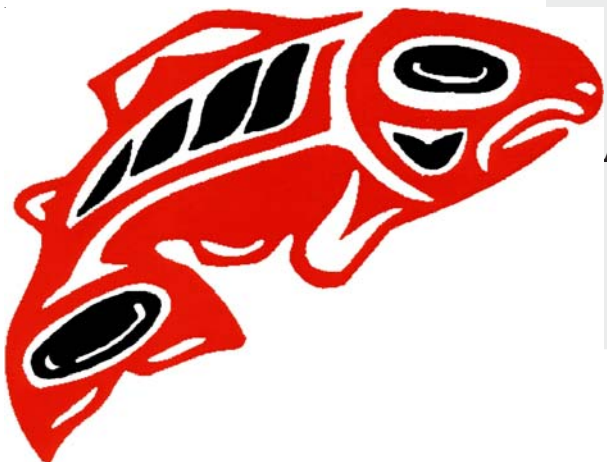


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Annual Salmon, Steelhead And Char Report:

2004

WRIA 10

Puyallup/White River Watershed

2005

INTRODUCTION

The Puyallup/White River watershed provides nearly 1,300 river miles (RM) of drainage. The three major river drainages include the Puyallup, White and Carbon Rivers which flow almost entirely within Pierce County. All originate from glaciers along the North and West slopes of Mt. Rainier, within Mt. Rainier National Park. The Carbon and White Rivers converge with the Puyallup River at RM 17.8 and RM 10.3 respectively. The Puyallup River continues to flow west into Commencement Bay in Tacoma. Significant tributaries to these main stem rivers include the Clearwater River, Greenwater River, Mowich River, Huckleberry Creek and South Prairie Creek. The Puyallup/White River watershed supports several species of salmonids including; spring and fall chinook (*Oncorhynchus tshawytscha*), coho (*O. kitsutch*), chum (*O. keta*), pink (*O. gorbuscha*), sockeye (*O. nerka*), steelhead (*O. mykiss*), cutthroat (*O. clarki*) and native char/bull trout (*Salvelinus confluentus*). Currently, chinook and bull trout are the only species federally listed as “threatened” under the Endangered Species Act. Steelhead may be offered the same protection under ESA as early as 2006. The Puyallup/White River watershed is identified as WRIA 10 (Watershed Resource Inventory Area 10) by the Washington State Department of Ecology. Hylebos and Wapato creeks are part of WRIA 10, yet are independent drainages that flow directly into Commencement Bay.

The Puyallup Tribe of Indians Fisheries Division (PTF) has conducted extensive spawning ground escapement surveys for salmon, steelhead and char in the Puyallup/White River watershed since 1991. The Washington Department of Fish and Wildlife (WDFW) also conducts surveys on several key drainages including the Clearwater River for steelhead, and South Prairie creek for chinook and steelhead. Precise escapement numbers for the upper White River drainage are known, since all adult salmon and steelhead that spawn in the upper White are captured in the U.S. Army Corps of Engineers’ (USACE) fish trap in Buckley (RM 23.4), then transported and released above Mud Mountain Dam (MMD @ RM 29.6). Therefore, surveys conducted on the upper White River are done primarily to determine fish distribution and spawning success. This is especially important regarding spring chinook, since adult production monitoring is an integral part of the White River Spring Chinook recovery plan.

Fall and early winter surveys are often marked by extremely low flows. Early in the chinook run, flows in many of the tributaries are too low to allow fish access. The resulting focus by chinook on mainstem spawning is extremely difficult to document due to highly turbid conditions in the Puyallup, White and Carbon Rivers. Low visibility conditions during the spring often affect the late steelhead surveys in the mainstem rivers as well. Most of this report summarizes spawning ground data gathered from August of 2004, through June of 2005. Chinook (pinks in odd years) surveys are conducted from the middle of August through the first week of November, with peak spawning occurring around the later part of September to early October. The window for char spawning is quit brief, taking place during the first three weeks of September. Coho are observed the mid part of September through late December, peaking around the end of October through the first part of November (South Prairie creek experiences a late run into February/March). Chum spawn as early as mid November, continuing through the first half of February, hitting their spawning peak in late December. Steelhead surveys begin in mid March and conclude in mid June. Most streams are surveyed by foot, with the exception of the Puyallup, White and Carbon Rivers, as well as South Prairie Creek, which are floated by raft. Data collected for all species during spawning surveys include the number of live and dead fish observed throughout the survey reach. With chinook, steelhead and char, the number and locations of redds are also documented. Redds are marked

with flagging, and the site locations are collected using a hand held GPS unit. Maps are generated from the GPS data collected, showing the redd locations for chinook and steelhead (Appendix C).

One of the Puyallup Tribe's most significant restoration goals is to rebuild depressed chinook stocks and remove them from ESA listing. The Puyallup Tribe operates seven acclimation ponds in the Puyallup/White River Watershed. Three of the acclimation ponds are used for reintroducing fall chinook and coho into a 30-mile reach of the Upper Puyallup River above Electron Dam (RM 41.7). The Electron diversion Dam had been an anadromous barrier for 97 years (1904-2000). A 215 foot fish ladder was construction and completed in the fall of 2000. Using acclimation ponds, limiting harvest, and making substantial gains in habitat restoration, the tribe will be able to accomplish this task. Levee setbacks, oxbow reconnections both inter tidal and upland, Commencement Bay cleanup, and harvest cutbacks have already been initiated. Only the jump-starting of chinook in habitat areas devoid of fish is left. Acclimation ponds are a proven method for increasing fish numbers on the spawning grounds. Hatchery rearing 200,000 fall chinook for acclimation ponds in the upper Puyallup River is a key component to restoration goals. Four other acclimation ponds are located in the upper White River drainage. These ponds are used for reintroducing White River spring chinook back into their endemic range. Hatchery rearing up to 900,000+ spring chinook for acclimation ponds in the upper White River is a fundamental part of the White River spring chinook recovery plan. In addition to the rearing and acclimation of juveniles, surplus live adult fall chinook from the WDFW Voights creek hatchery are planted in the upper Puyallup drainage when surplus fish are available. In addition, the Puyallup-White River winter steelhead stocks have been in serious decline for the past several years. Tribal and state fisheries managers are currently working on a recovery plan to improve future steelhead returns and hope to implement this plan in early 2006.

The information and spawning data contained within this report is not all inclusive of the entire watershed, but rather focuses on those stream and river segments known to support the majority of spawners. Over the past few season, the Puyallup/White River system has experienced an increase in escapement, range and distribution for all salmon species, especially chum and pinks. Over 13,000 pink salmon were transported above Mud Mountain Dam on the White River in 2003. The first pink salmon surveys above MMD were conducted that year. The pink escapement forecast for 2005 in the Puyallup/White is expected to be nearly 115,000, and wild chum over 15,000. Spring and Fall chinook, as well as coho escapements have continued to strengthen, all this has made it necessary to cover more river miles to determine the spawning success/escapement and distribution for all species. Continuing efforts are being made by the tribe to increase and expand the survey coverage area in order to improve escapement estimates. Improvements are especially needed in expanding bull trout and steelhead surveys. Currently, little or no effort is being expended on surveying the areas above the Electron diversion dam, the mainstem White above Mud Mountain Dam or above the gorge on the upper Carbon. Adult chinook, coho and steelhead are know to be accessing the upper Puyallup and Mowich Rivers, as well as their associated tributaries, but an exceedingly small amount of data has been collected on where and how many of these fish are spawning in the upper Puyallup River basin.

This report is organized alphabetically by stream name, project or facility. It includes river miles surveyed, WRIA designation, survey dates, access to survey reaches and a brief description. Most of the data is graphically represented by species. In cases of streams that were not surveyed with any regularity or when few fish were observed, no graphs are presented. Some graphs in this report were generated using data collected by WDFW. Also included in this report is information and data collected from several other Puyallup Tribal Fisheries projects including; the U.S. Army Corps of Engineers (USACE) fish trap on the White River, the Electron fish bypass facility and diversion fish ladder, the Puyallup River juvenile salmonid production assessment project (smolt trap), and the Puyallup Tribe's salmon hatcheries on Clarks and Diru creeks.

Summary of 2004/2005 Accomplishments

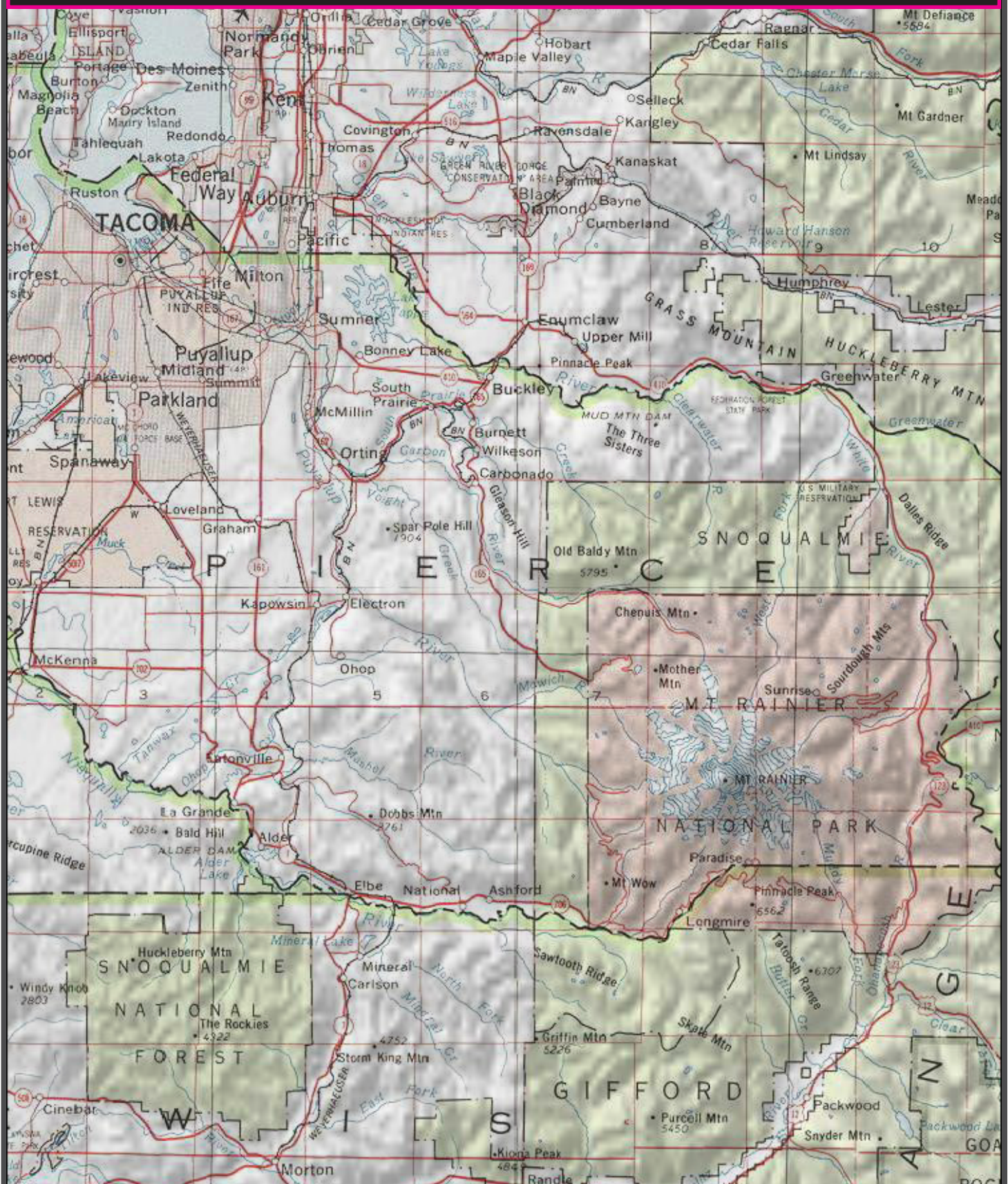
Several fisheries escapement and enhancement projects were continued or completed during the 2004 - 2005 season. Each of the following projects or studies is covered in more detail in this report. Other Puyallup tribal fisheries projects involving harvest, TFW, environmental, management and habitat are covered in separate reports.

- ❖ Spring chinook spawning surveys in the upper White River above Mud Mountain Dam.
- ❖ Spring/Fall chinook spawning surveys in the Puyallup/ lower White River Watershed (below RM 24.3).
- ❖ Char spawning surveys in the upper White River above Mud Mountain Dam.
- ❖ Coho spawning surveys in the Puyallup/White River Watershed.
- ❖ Chum spawning surveys in the Puyallup/ lower White River Watershed (below RM 24.3).
- ❖ Winter steelhead spawning surveys in the Puyallup/White River Watershed.
- ❖ Juvenile salmonid production assessment project on the lower Puyallup River.
- ❖ Sampled and monitored adult salmonids at the USACE trapping facility on the White River in Buckley.
- ❖ Monitored, sampled and evaluated the migration and survival of salmonids in Puget Sounds Energy's Electron fish bypass facility on the Puyallup River.
- ❖ Spring chinook acclimation project on upper White River Tributaries: Huckleberry creek, Cripple creek, Clearwater and Green Rivers.
- ❖ Fall chinook acclimation project on the Puyallup River and Hylebos: Clarks creek, Cowskull creek and Hylebos creek.
- ❖ Coho acclimation project on the upper Puyallup River: Rushingwater creek and Cowskull creek.
- ❖ Fall chinook hatchery production at Puyallup Tribe hatchery facility on Clarks creek.
- ❖ Chum hatchery production at Puyallup Tribe hatchery facility on Diru creek.
- ❖ Adult Coho surplus plants in the upper Puyallup River: North Fork Puyallup River and Deer creek.

Abbreviations and Acronyms

CFS: Cubic Feet Per Second
CWT: Coded Wire Tag
DIDSON: Dual Frequency Identification Sonar
DNA: Deoxyribonucleic acid (genetic sample)
ESA: Endangered Species Act
GIS: Geographic Information Systems
GPM: Gallons Per Minute
GPS: Global Positioning System
LP: Lower Pond
LWD: Large Woody Debris
M: Marked fish (internal/external tags or fin clipped), Hatchery origin
MMD: Mud Mountain Dam (USACE Facility)
MS-222: Tricaine methanesulfonate (anesthetic)
N/O: None Observed
NPS: National Park Service
NTU: Nephelometric Turbidity Units
NWIFC: Northwest Indian Fisheries Commission
RM: River Mile
PIT: Passive Integrated Transponder (internal tag)
PSE: Puget Sound Energy
PTF: Puyallup Tribal Fisheries
TFW: Timber, Fish and Wildlife
U: Unmarked fish (no internal/external tags or fin clips), Wild
UP: Upper Pond
USACE: United States Army Corps of Engineers
USFS: United States Forest Service
WDFW: Washington Department of Fish and Wildlife
WRIA: Washington Resource Inventory Area
0: Zero Aged fish (less than one year old), Young of the year
1+: 1 Year + age fish

Puyallup/White River Watershed and Area Map



TN ★ / MN
18°

0 5 10 15 20 25 miles
0 5 10 15 20 25 30 35 40 km
Map created with TOPO!® ©2003 National Geographic

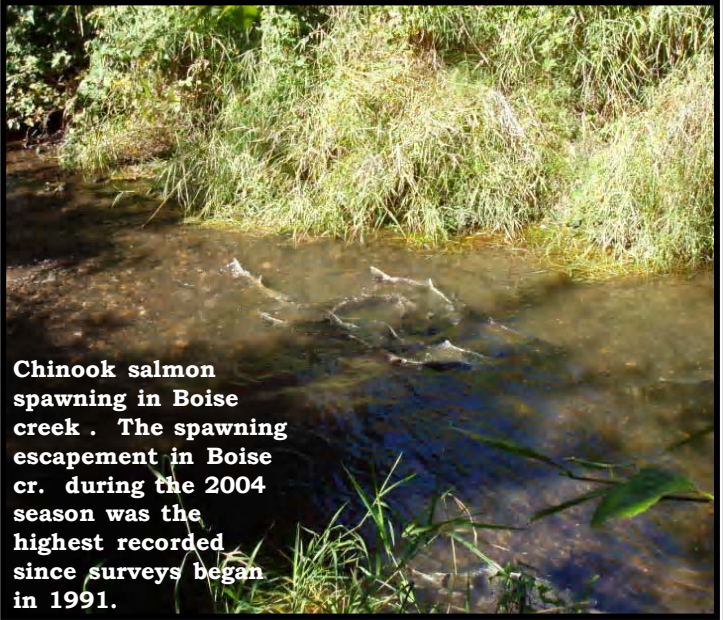
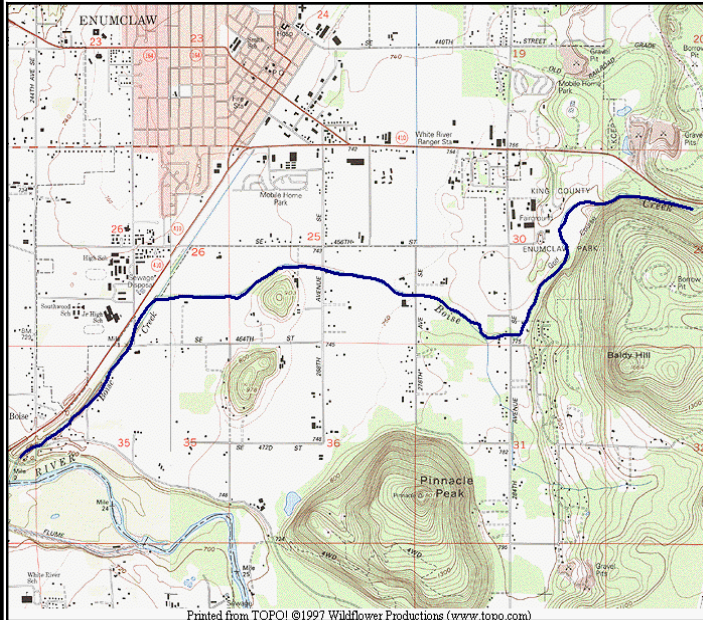
Puyallup Tribal
Fisheries
August 2005



BOISE CREEK

WRIA: 10.0057 - WHITE RIVER

2004 - 2005



Chinook salmon spawning in Boise creek. The spawning escapement in Boise cr. during the 2004 season was the highest recorded since surveys began in 1991.

River miles surveyed: 0.0 to 4.5
Dates surveyed: 8/14/04 to 6/6/05
Species surveyed: Chinook, Coho, Pink, Steelhead

Access

Mile 4.5: Hwy 410 East of Enumclaw golf course to Boise trail.
Mile 2.2: 268th St. (Blake St.) in Enumclaw (halfway) crosses Boise south of town.



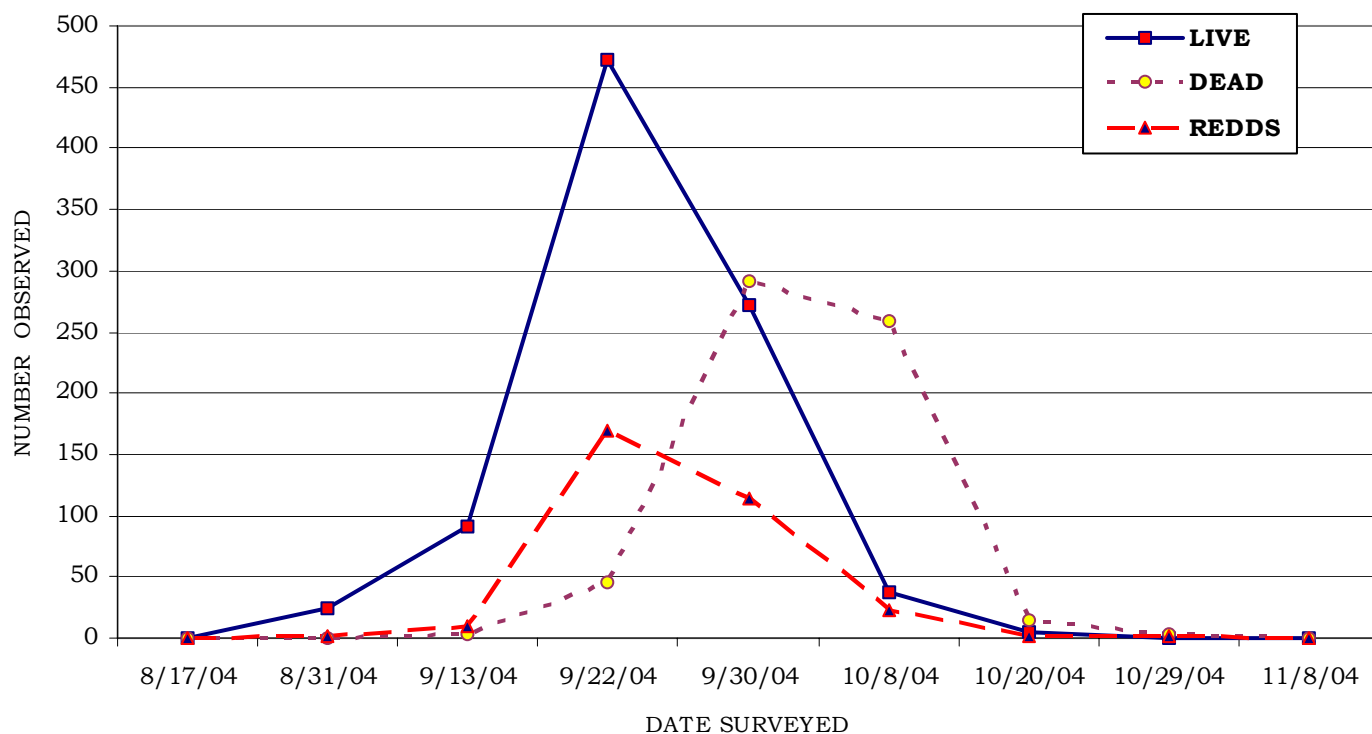
reduction in spawning opportunities. Chinook and steelhead are especially vulnerable to poaching and harassment in this urban stream. Surrounding agricultural land use continues to impact channel conditions in Boise Creek (right). Tremendous improvements to riparian conditions are possible but require willing land owners, technical expertise and funding. Despite its many habitat related shortcomings, Boise Creek continues to support a healthy and stable population of wild steelhead, a remarkable fact in light of the basin-wide declines.

DESCRIPTION

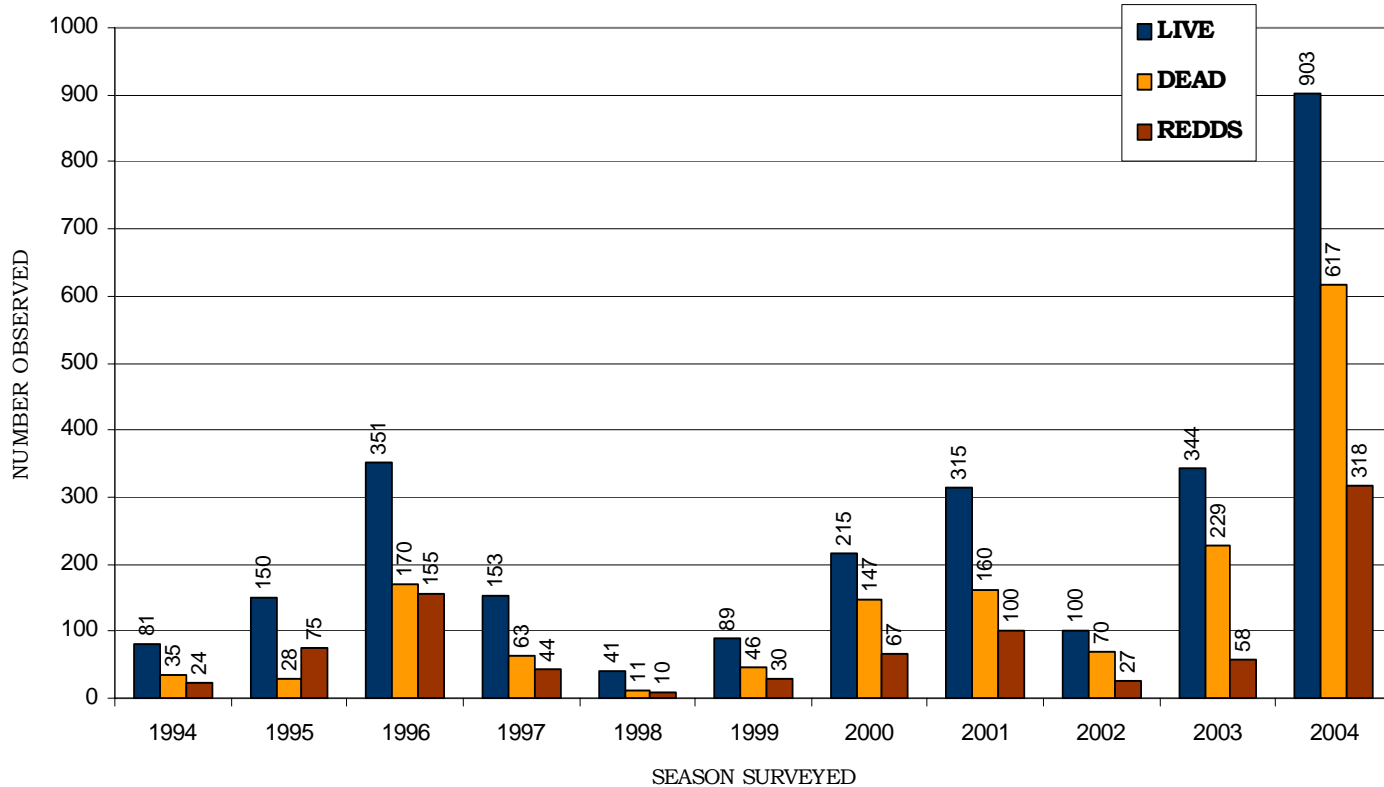
Boise creek is a tributary of the White River, converging with the White just downstream of the HWY. 410 bridge at RM 23.5. Boise is a highly productive tributary of the White, providing 4.5 linear miles of suitable habitat for all anadromous species. A bedrock falls at RM 4.5 marks the upper extent of adult migration. Below the falls, Boise flows through a step-pool channel within dense second growth forest for approximately 0.2 miles. The next 0.5 miles is a lower gradient reach flowing within the county golf course in the city of Enumclaw. The riparian zone here is very sparse, the banks are merely rip raped and bordered by maintained turf grass. There is a short section below RM 4.0 with an intact hardwood riparian zone before Boise creek begins to flow through agricultural land, primarily used for maintaining cattle. This reach extends from approximately RM 3.7 down to RM 0.3, much of the stream along this stretch is incised to depths of 20 feet or more (left). Spawning activity for all species occurs throughout the entire 4.5 miles. The gradient increases in the lower 0.3 miles with a corresponding



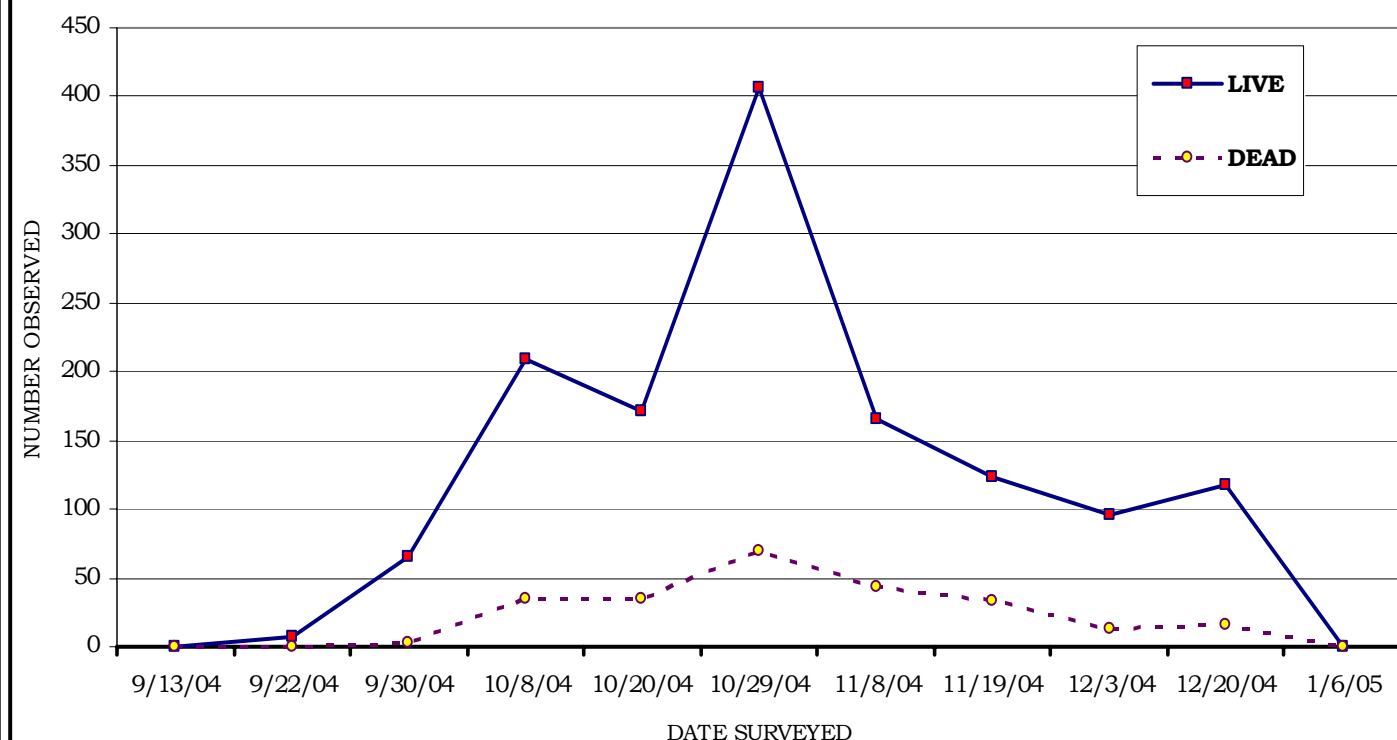
2004 BOISE CREEK CHINOOK COUNTS



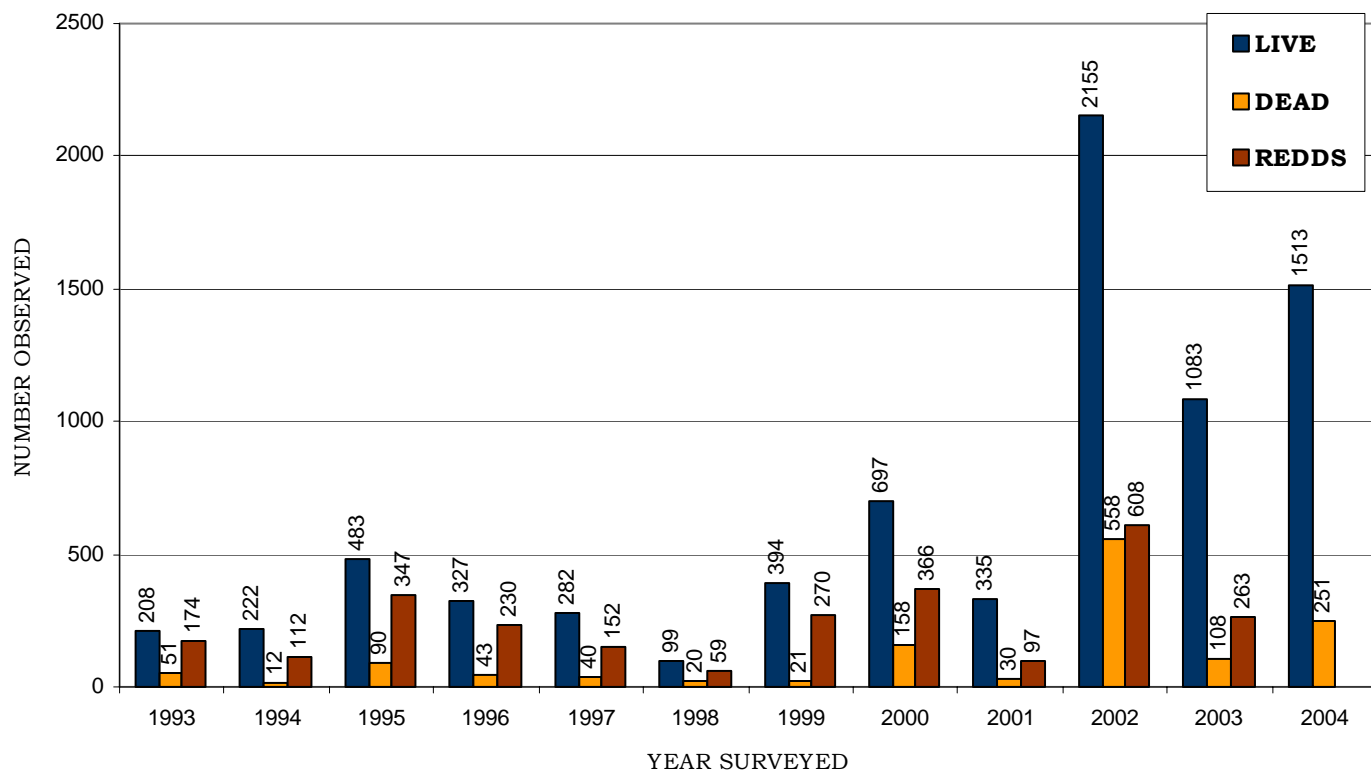
BOISE CREEK CHINOOK SEASON COMPARISONS (1994 - 2004)



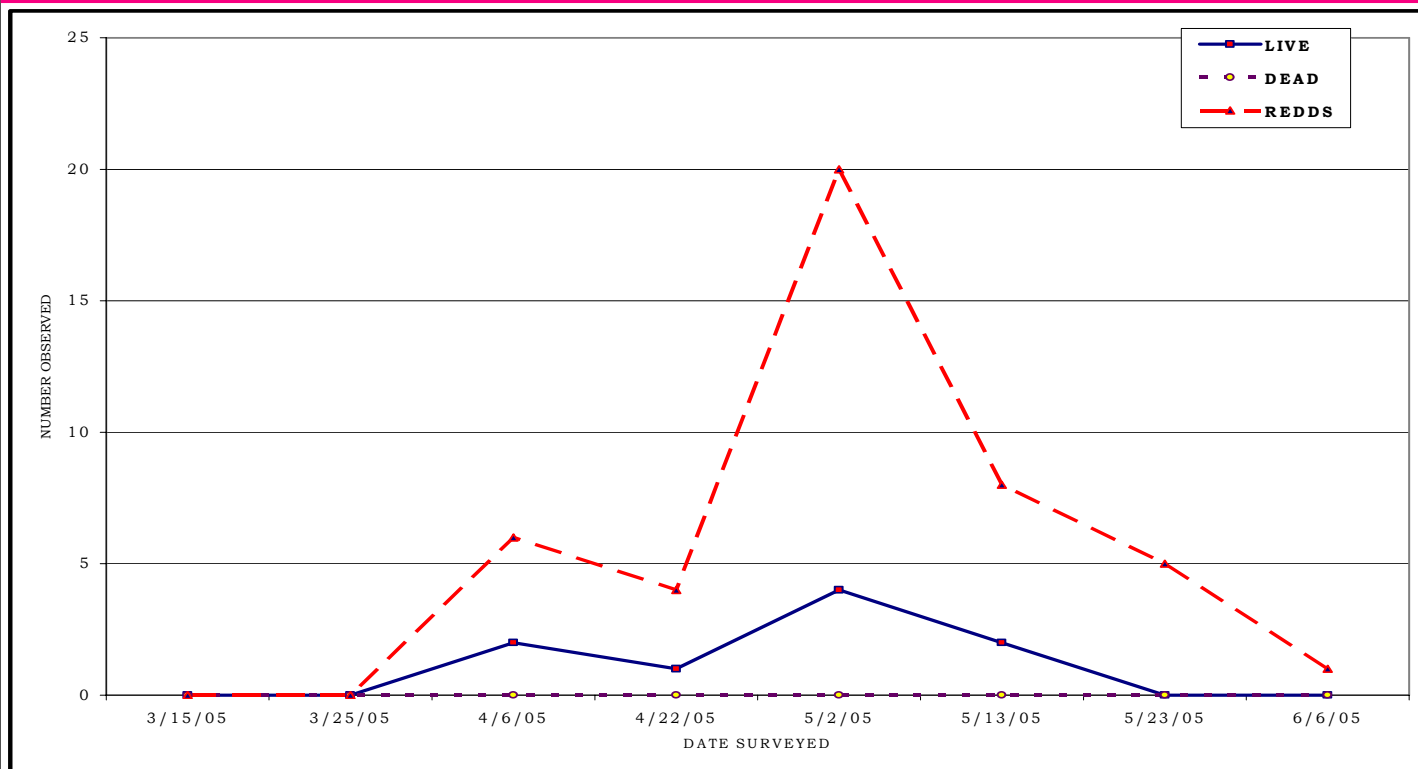
2004 BOISE CREEK COHO COUNTS



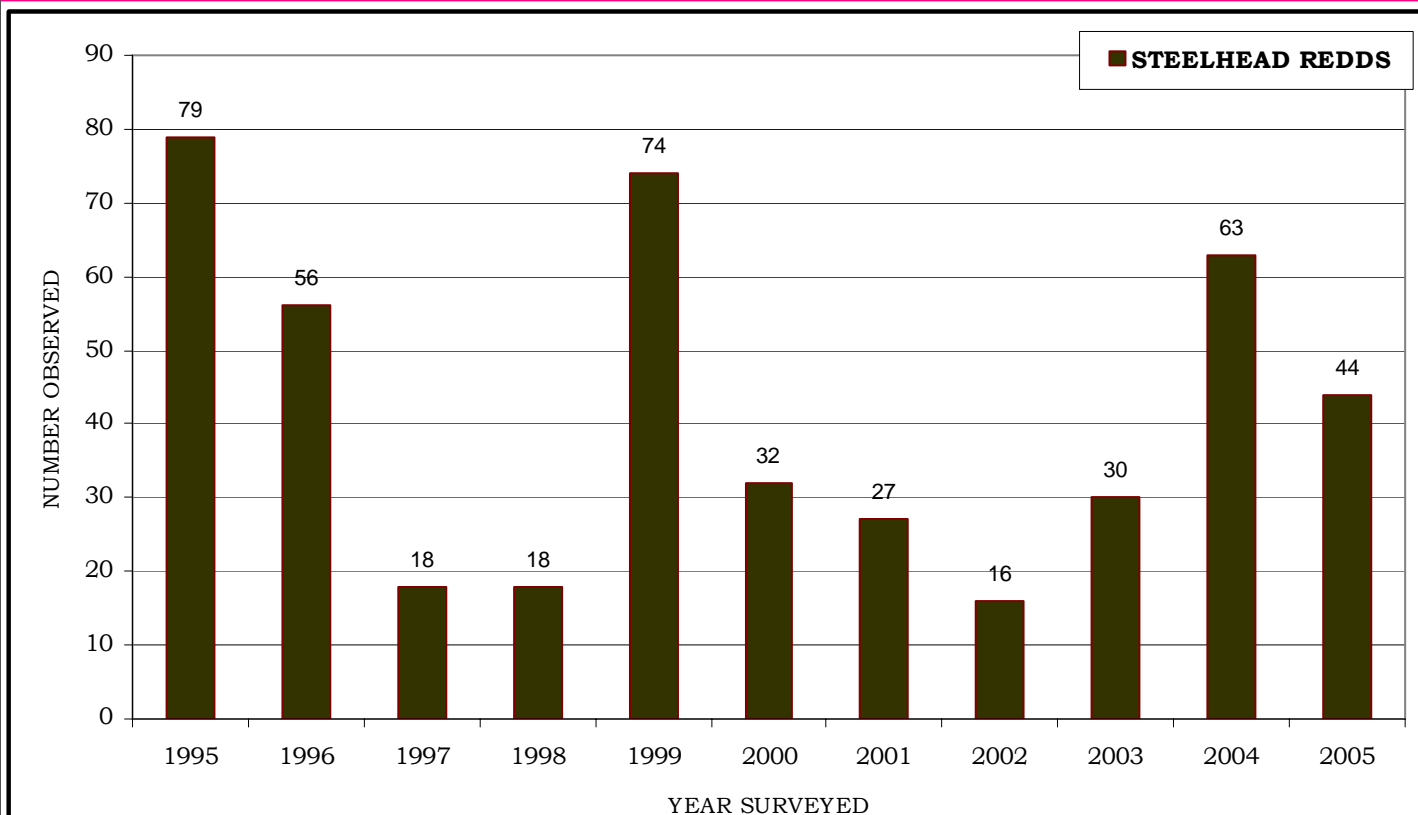
BOISE CREEK COHO SEASON COMPARISONS (1993 - 2004)



2005 BOISE CREEK STEELHEAD COUNTS



BOISE CREEK STEELHEAD REDDS SEASON COMPARISONS (1995 - 2005)



BUCKLEY: USACE FISH TRAP

WRIA: 10.0031 - USACE FISH TRAP -WHITE RIVER

2004 - 2005



**U.S. Army Corps of Engineers'
(USACE) Fish trap**
River mile: 24.3

Species Sampled: Spring Chinook, Coho,
Steelhead, Char, Pink, Sockeye

DESCRIPTION

Salmon returning to the upper White River enter the USACE trap located at RM 24.3 near Buckley, WA. (left photo). During the months that salmon return to the White River, the USACE empties the trap daily, the trap is hoisted to a tank truck and fish are released from the trap into the truck (center left photo). Fish are then transported above Mud Mountain Dam and released back into the White River at RM 33.6, four miles above the dam and about one mile below the confluence with the Clearwater River.

Chinook are dip-netted into a bin and anesthetized. All fish are examined for fin clips and wanded for cwt's.



Loading fish from the USACE trap, into a truck for transport above Mud Mountain Dam. The fish will be released back into the White river at RM 33.6

Puyallup Tribe Fisheries staff sample the contents of the trap once a week throughout the entire year. During the spring chinook run, the trap is sampled 3 to 5 days per week. Spring chinook are dip-netted into a bin and anesthetized with MS-222. All fish are examined for fin-clips and wanded for coded-wire tags with a metal detector. Species of salmonids captured in the trap include chinook, coho, pink, sockeye, steelhead and char. Bull Trout (Char) (bottom right) and steelhead (bottom left) are caught by dip-net and sampled by Puyallup Tribe fisheries staff. DNA and scale samples are collected from

both species, a small amount of the anal fin is removed and preserved for DNA analysis. In addition to DNA and scale

samples, char are floy tagged and transported above Mud Mountain dam. Wild steelhead are transported above Mud Mountain dam, while hatchery steelhead are returned back into the White River below the USACE trap as per agreement with the Muckleshoot Indian

Tribe and the State of Washington.

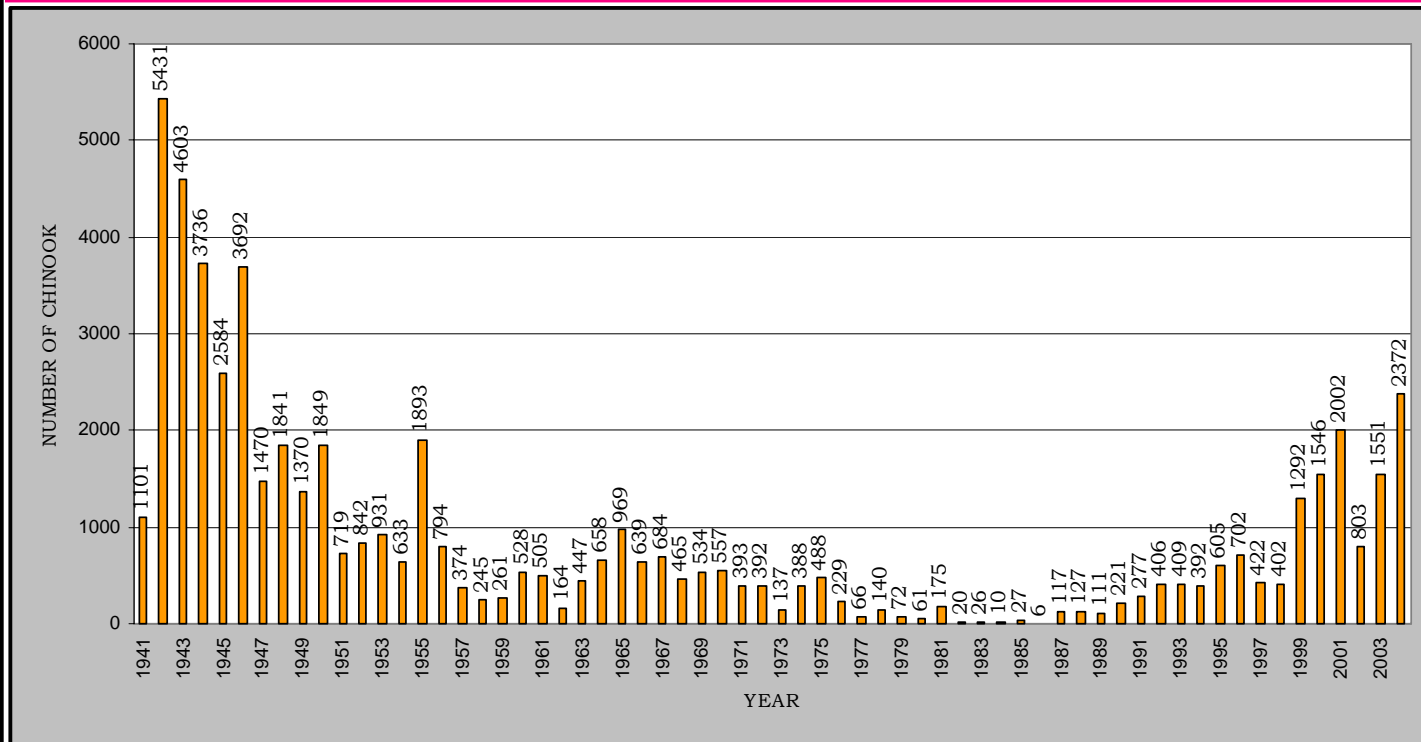


Steelhead

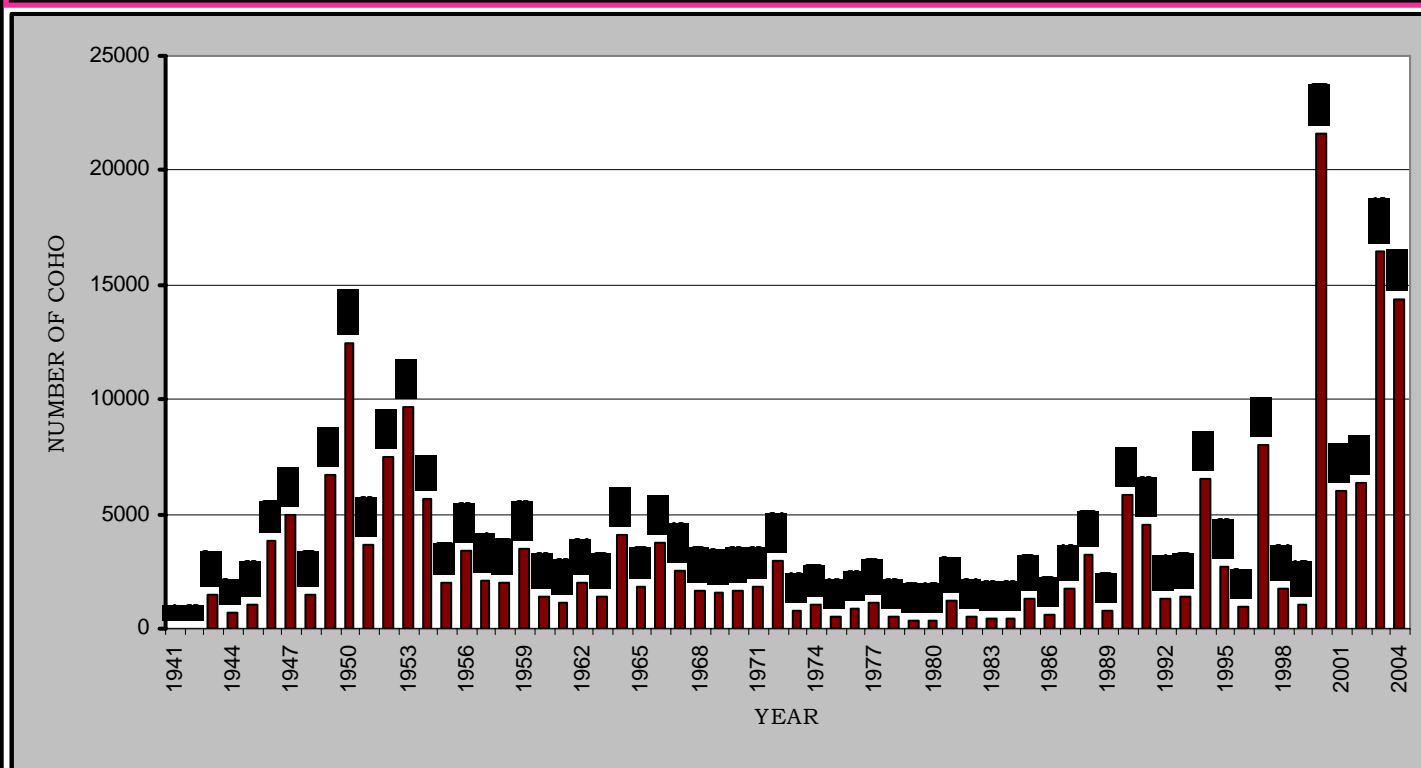


Bull Trout/Char

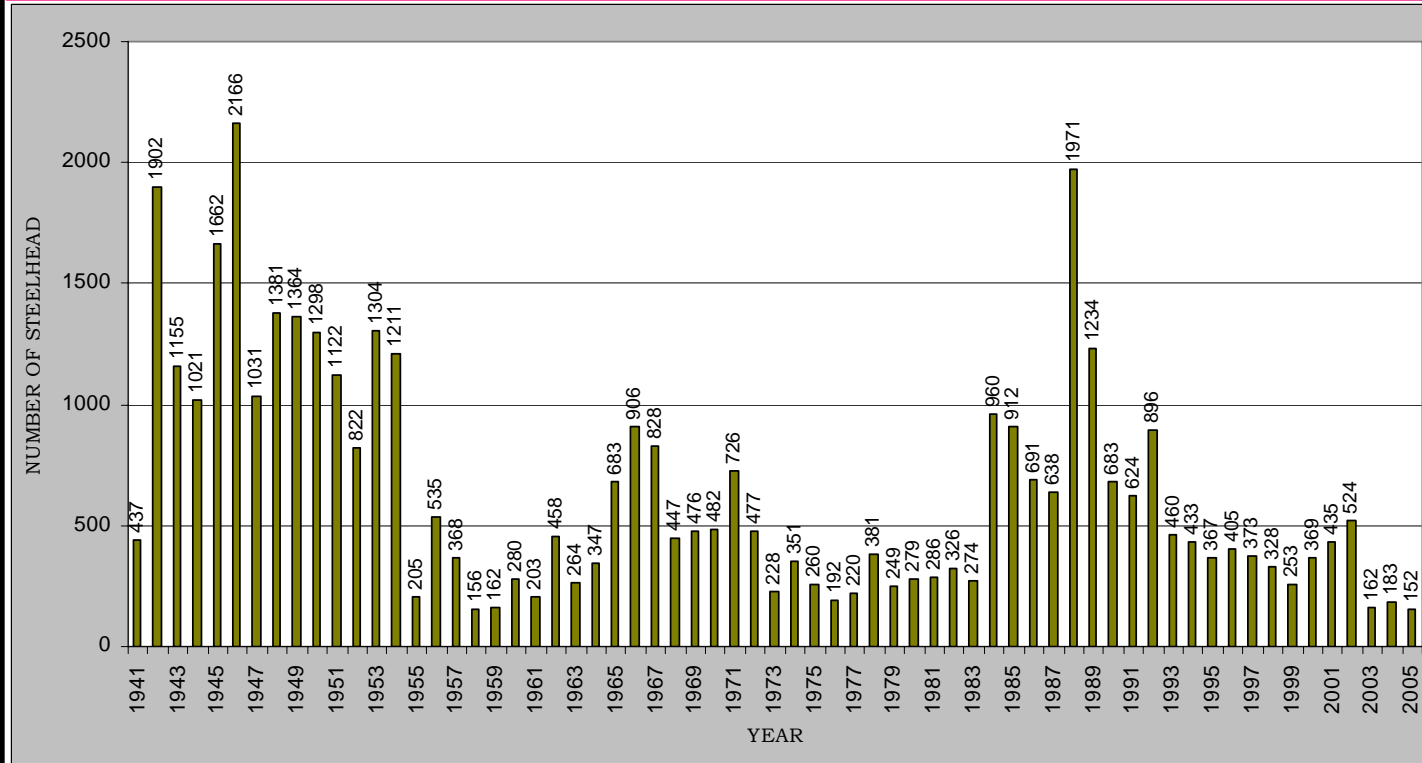
USACE Trap Counts Chinook Transported Above Mud Mountain Dam (1941 - 2004)



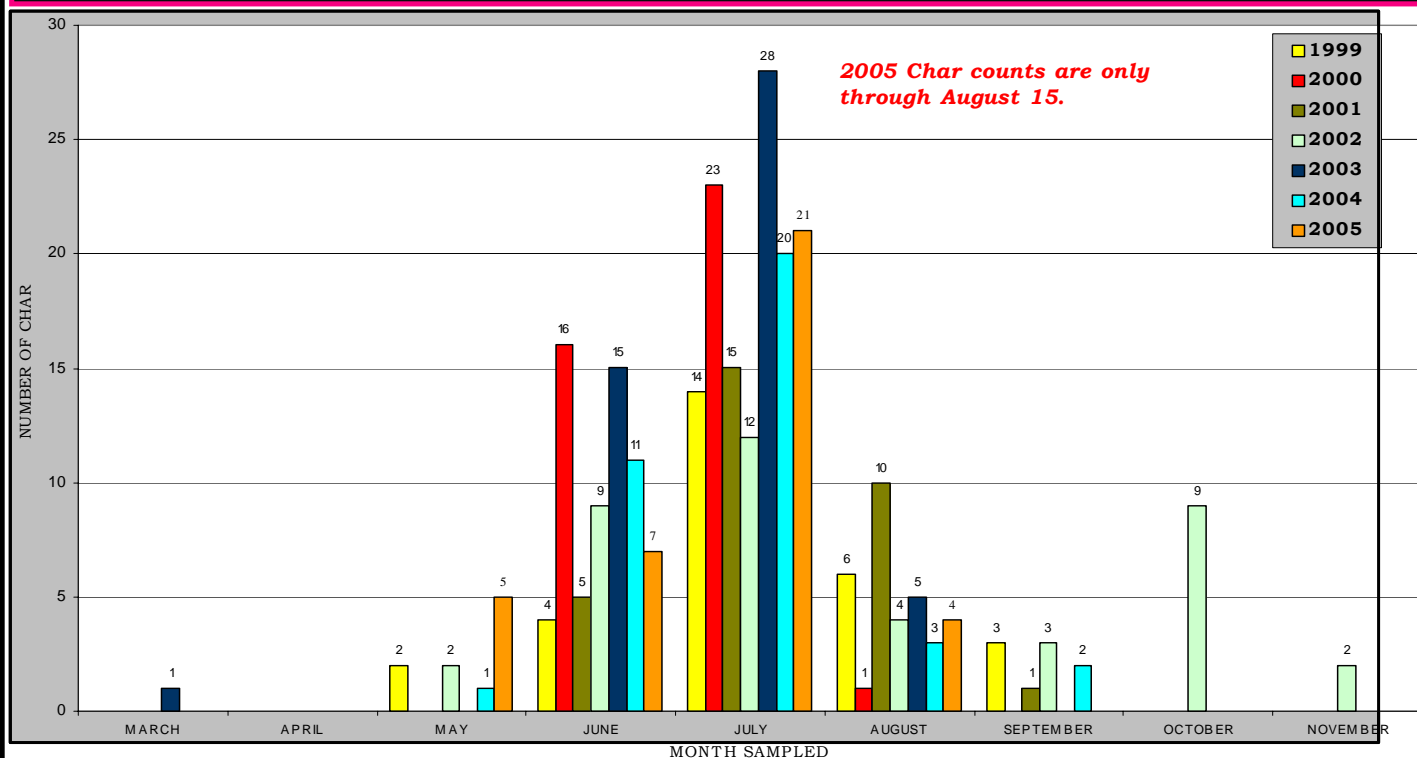
USACE Trap Counts Coho Transported Above Mud Mountain Dam (1941 - 2004)



USACE Trap Counts Steelhead Transported Above Mud Mountain Dam (1941 - 2005)



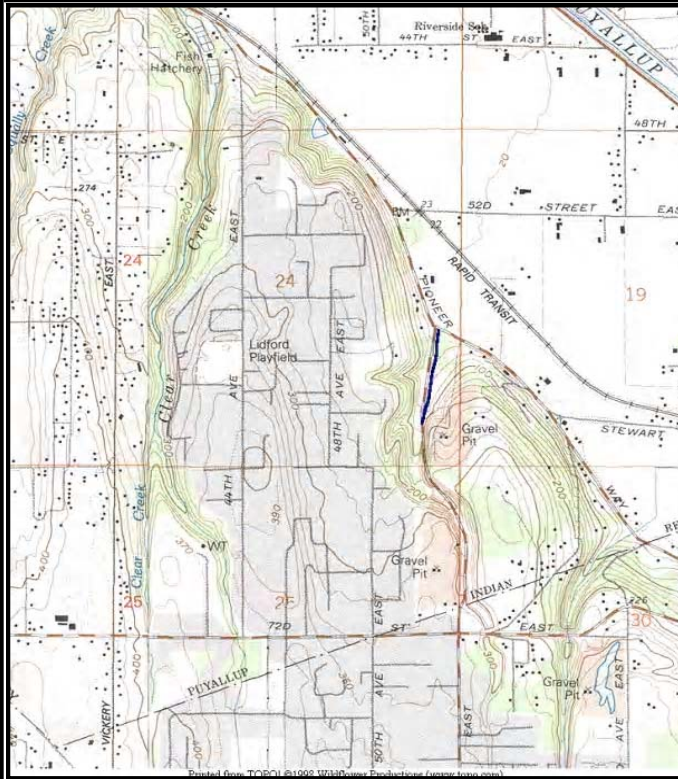
USACE Trap Counts Char Captured, Tagged, and Transported above Mud Mountain Dam (1999 - 2005)



CANYON CREEK

WRIA: 10.*** - PUYALLUP RIVER

2004 - 2005



Chum salmon spawning in Canyon creek.

River miles surveyed: 1.0 to 1.2
Dates surveyed: 11/22/04 to 2/10/05
Species surveyed: Chum
Access
Mile 0.5: Intersection of Canyon and Pioneer.

DESCRIPTION

Canyon creek is a small tributary to Clear creek. Little stream complexity exists within Canyon creek, and seasonal flows are inadequate to allow access for chinook or steelhead to spawn. Chum, are the only species observed spawning in significant numbers. Coho are periodically seen in the same reach as chum, but no surveys are conducted by the Puyallup Tribe until the beginning of the chum run. There is approximately 160 yards of suitable spawning habitat in Canyon creek, this section flows along Canyon road upstream of Pioneer Way. The gradient increases above Pioneer, but there are several short stretches of gravel between Pioneer Way and the culvert crossing under Canyon Road. The culvert doesn't appear to be an impediment to chum, since chum can be observed spawning in the culvert. However, the steep gradient above the culvert does impede chum, as no fish are observed above the culvert during the peak of the run.

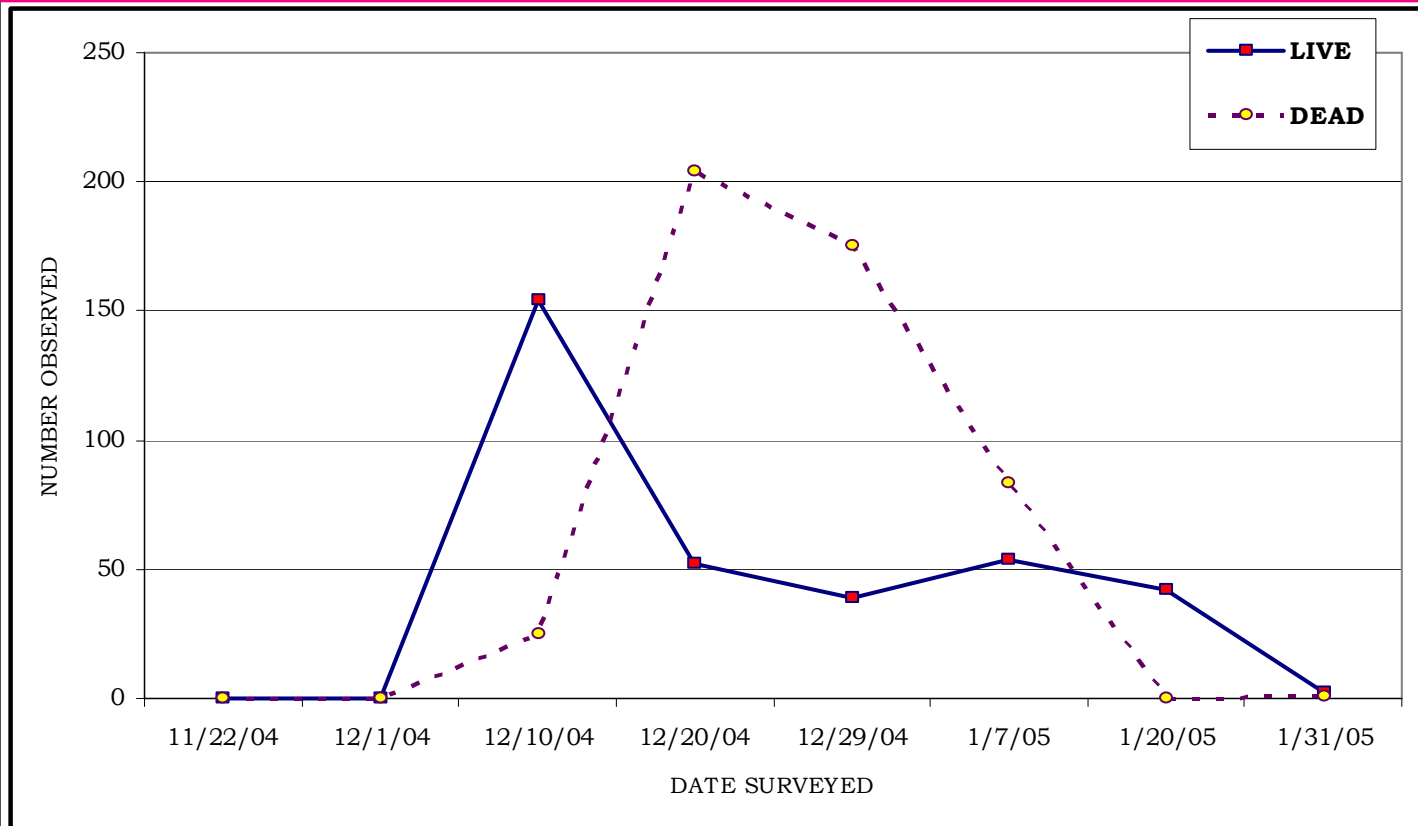
The channel above the culvert has been engineered with the placement of log weirs to retain gravel. They appear to be only moderately effective because the amount of fines in the entire reach is excessive. Downstream of Pioneer, the channel substrate consists of fine sand and extremely compacted small gravel.

This stream has not been surveyed consistently over the past decade, therefore only the last 4 years of seasonal comparisons are available.

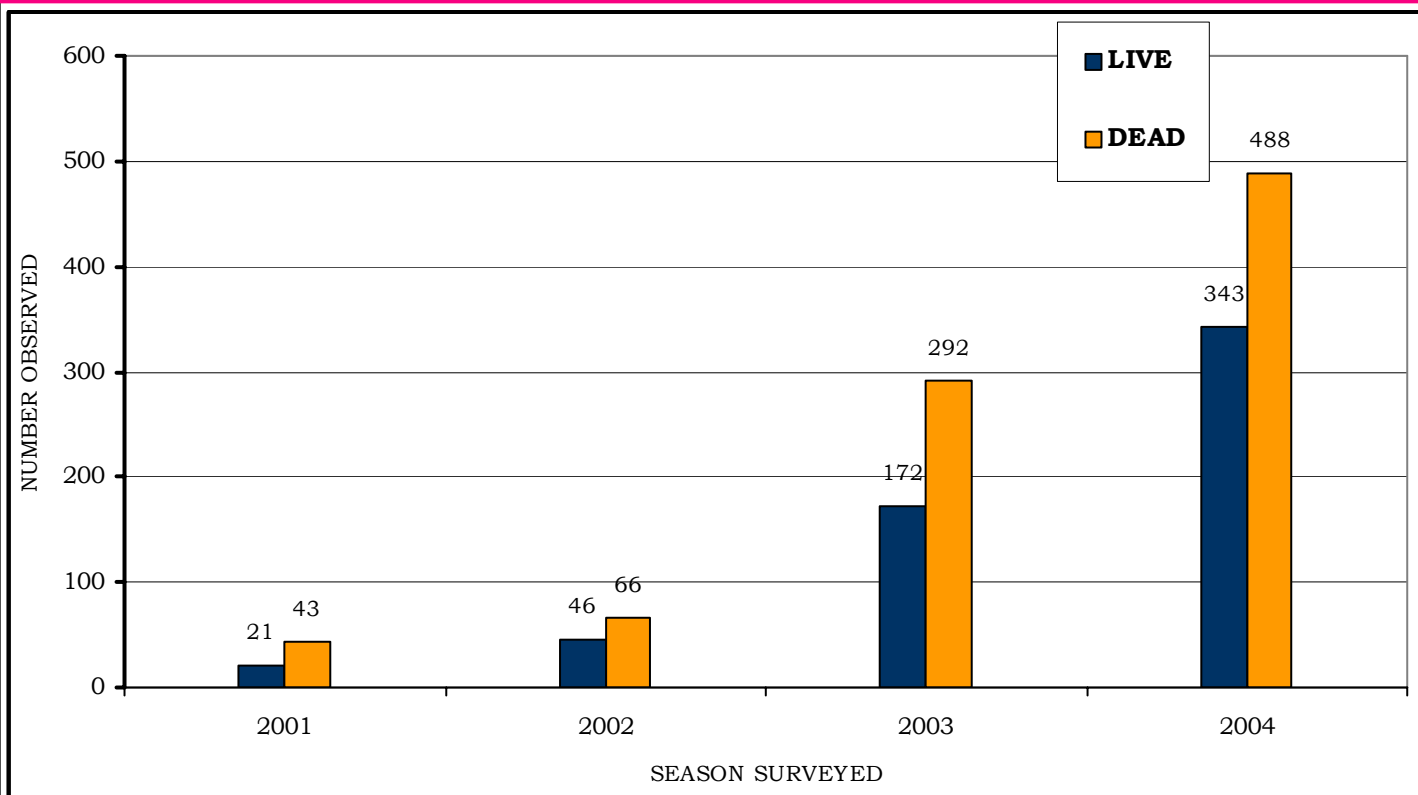


Canyon creek looking downstream towards Pioneer Way.

2004 CANYON CREEK CHUM COUNTS



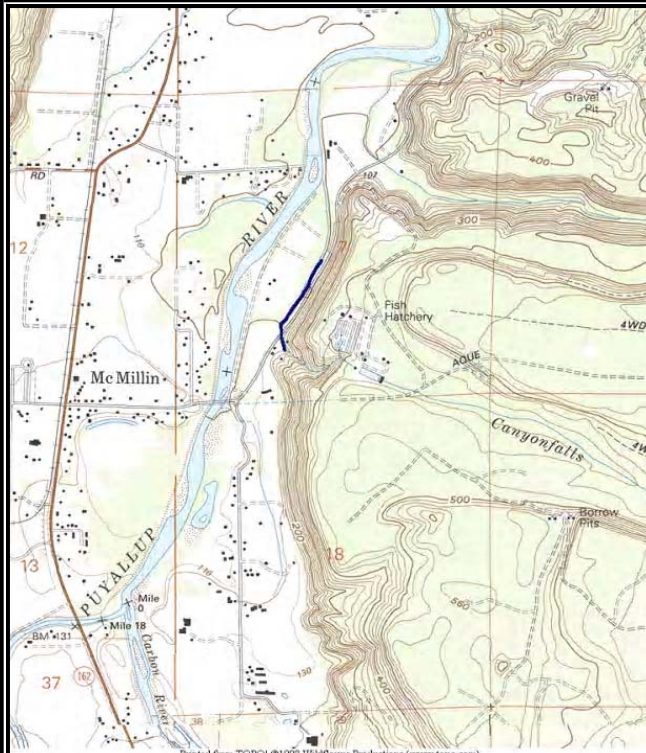
CANYON CREEK CHUM SEASON COMPARISONS (2001 - 2004)



CANYONFALLS CREEK

WRIA: 10.0410 - PUYALLUP RIVER

2004 - 2005



Short reach along McCutcheon road providing excellent spawning opportunities.

DESCRIPTION

Canyonfalls creek is a small tributary entering the Puyallup River at approximately RM 16.2. Canyonfalls is primarily a spring fed stream that flows with relative clarity and consistency, even in late summer. Above the culvert on McCutcheon Rd. at RM 0.5 the gradient quickly increases but there are several pockets of usable spawning gravel. In 2003, a large cement box culvert replaced the old culvert under McCutcheon Road. Downstream of the road, the substrate is a combination of sand and gravel within a low gradient pool-rifle channel. The riparian area is primarily alder and salmonberry. The vegetation along the right bank is limited due to the extremely close proximity of McCutcheon Rd. However, the reach directly below the road does contain a large amount of sand and fine sediment. In the summer of 2002, 220 cubic yards of 1 to 3 inch spawning quality drain rock was deposited directly downstream of the McCutcheon road culvert. The rock was distributed along an approximately 0.2 mile stretch of the creek. The rock was deposited as a result of a settlement agreement between the Puyallup tribe and Fennel Resources which has a gravel mining operation located on Fennel creek. Chinook, coho and chum are the most prevalent species observed spawning in the creek. In the past, steelhead have been documented spawning in the creek, yet as with many streams within the Puyallup watershed, none have been observed for the past several years. In 2004, a beaver dam below the survey reach prevented chinook from accessing the upper section of Canyonfalls.

River miles surveyed: 0.3 to 0.6

Dates surveyed: 8/16/04 to 5/23/05

Species surveyed: Chinook (N/O) Coho, Chum, Steelhead (N/O)

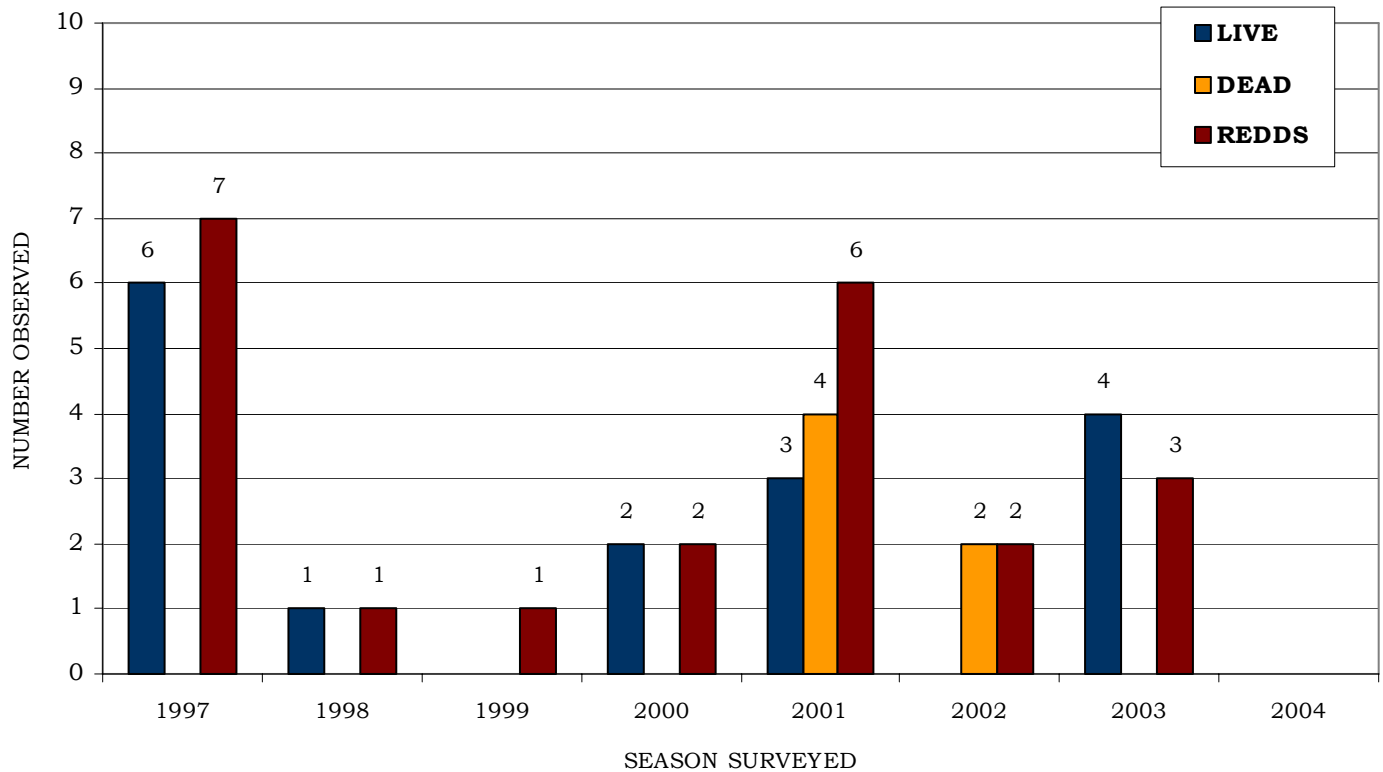
Access

Mile 0.5: Follow Highway 162 into McMillin and turn east onto 128th Street. The first stream crossing after the Puyallup River bridge is Canyon falls.

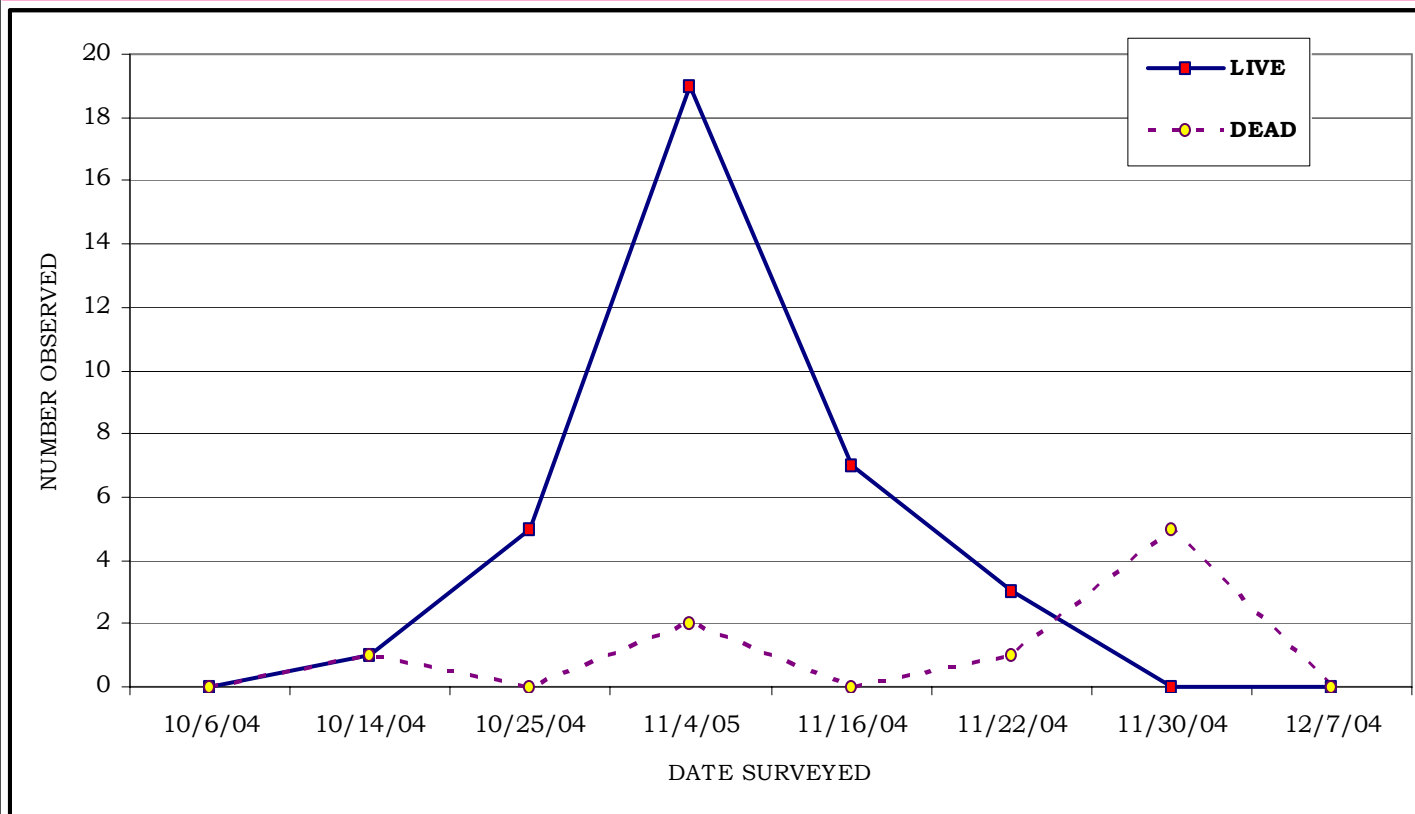


In 2003, a large cement box culvert replaced the old culvert under McCutcheon Road. The gradient increases significantly beyond the culvert.

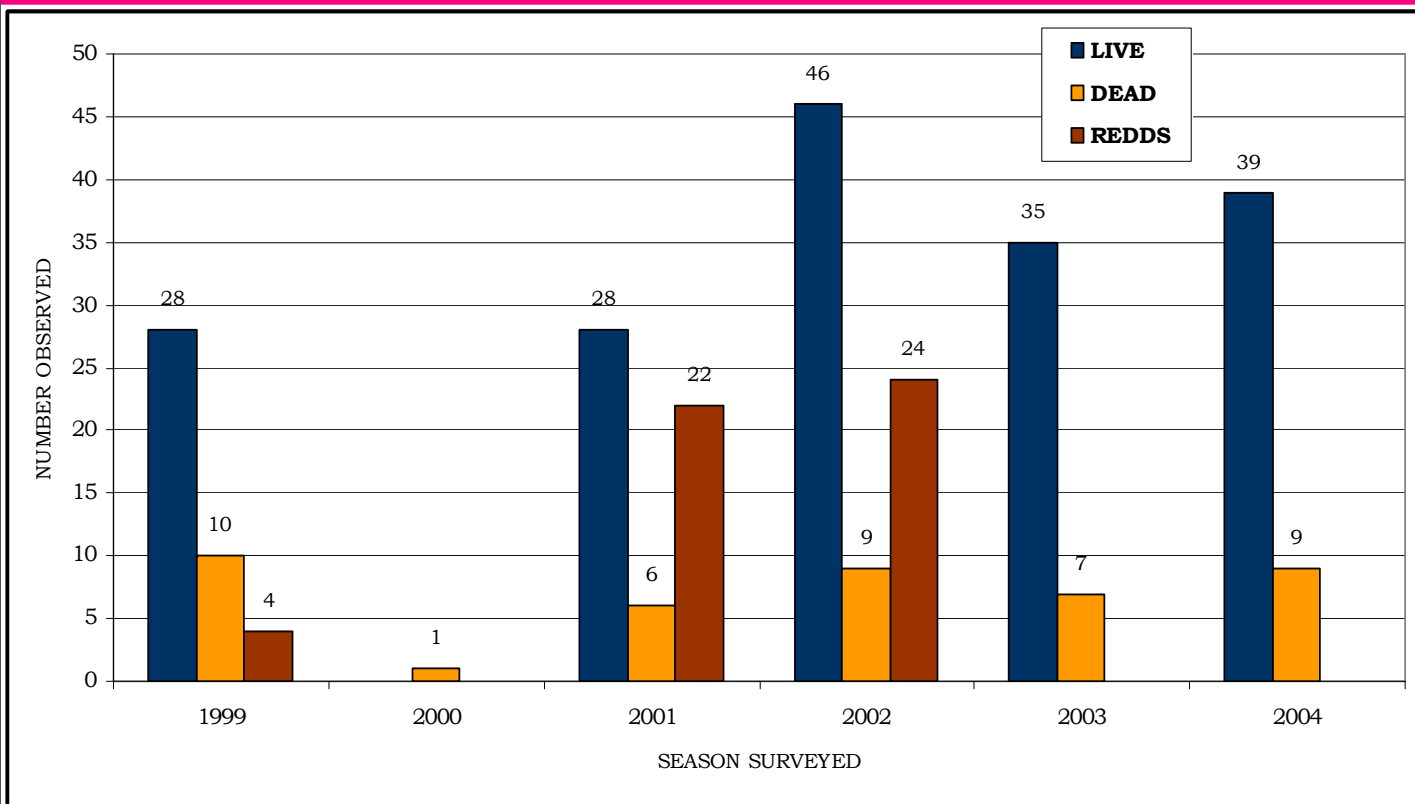
CANYONFALLS CREEK CHINOOK SEASON COMPARISONS (1997 - 2004)



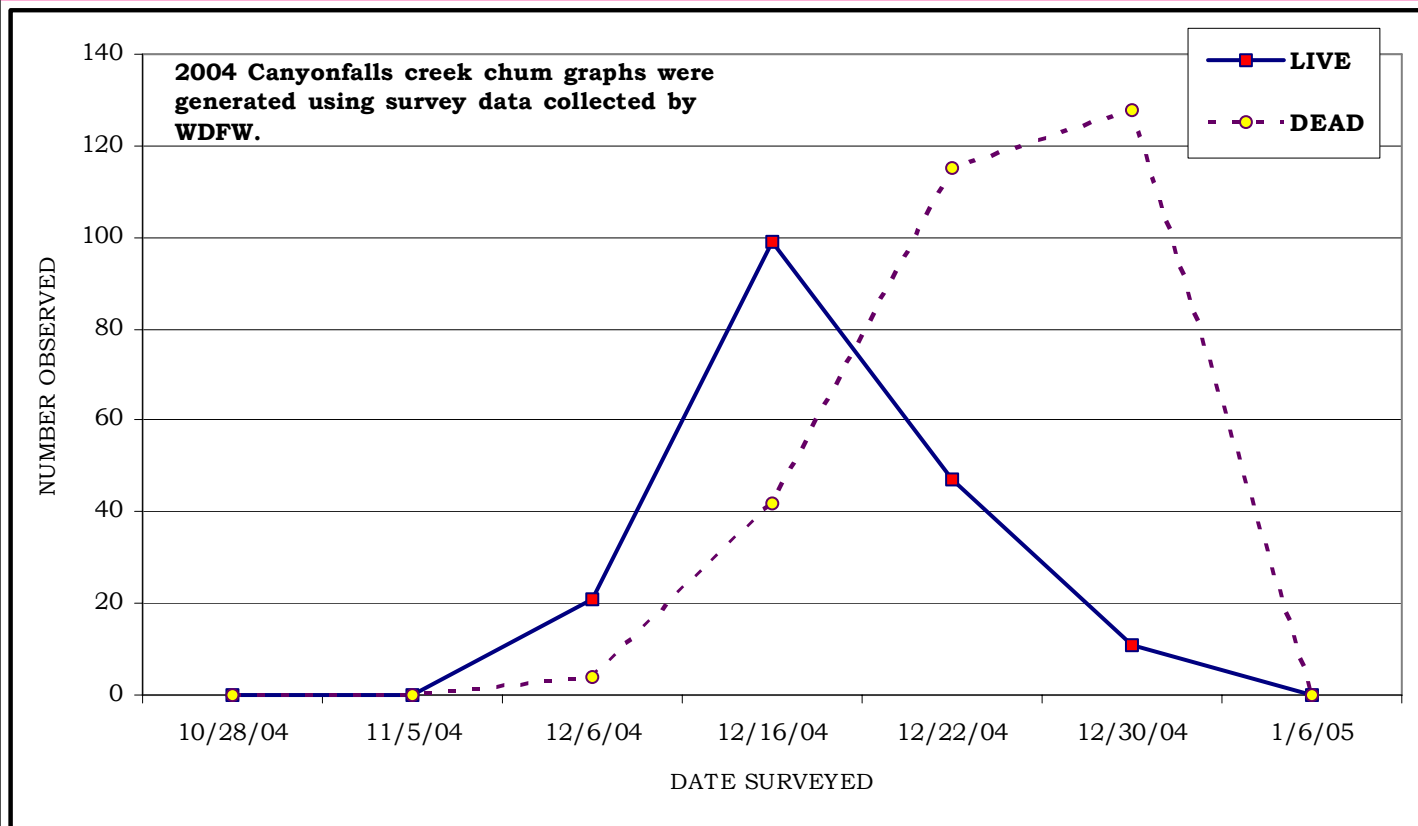
2004 CANYONFALLS CREEK COHO COUNTS



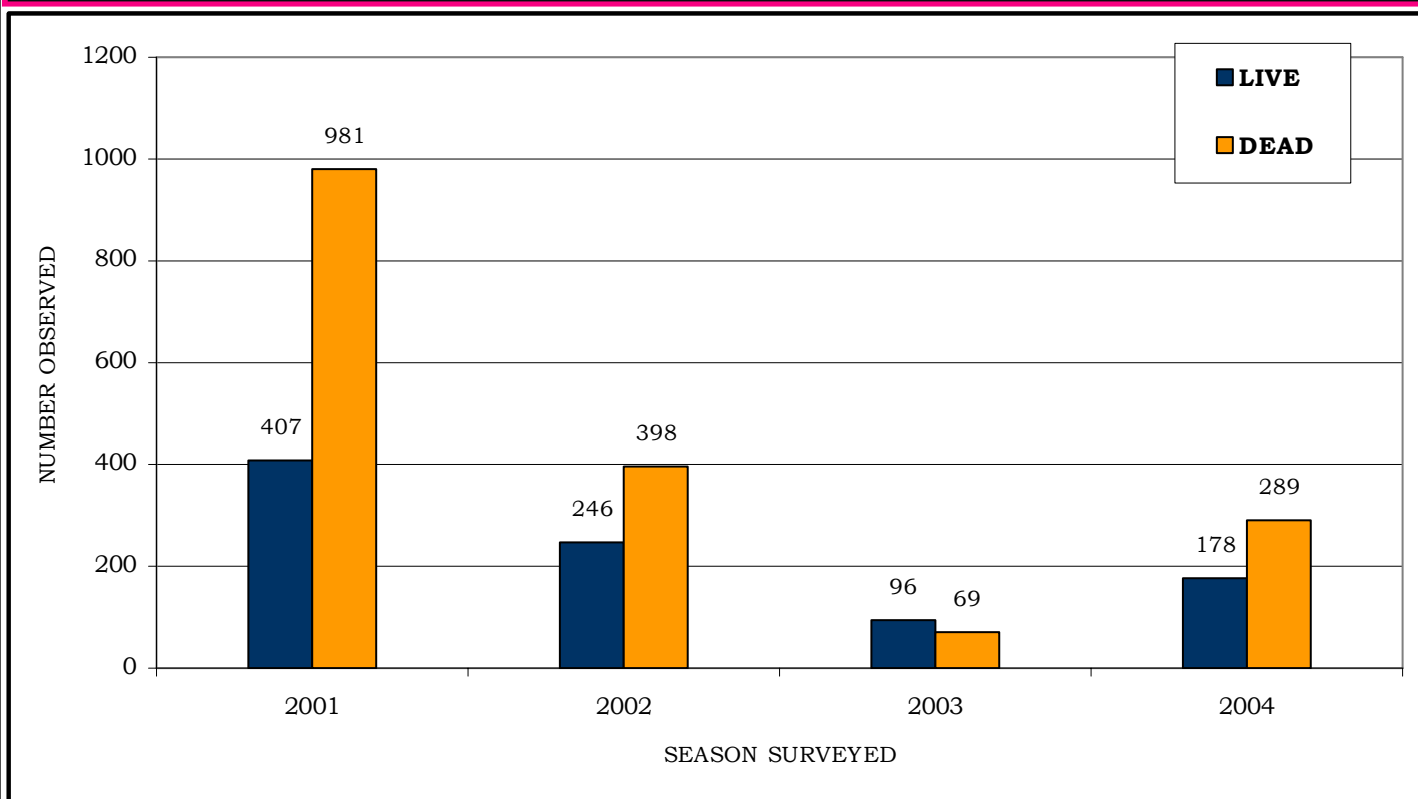
CANYONFALLS CREEK COHO SEASON COMPARISONS (1999 - 2004)



2004 CANYONFALLS CREEK CHUM COUNTS



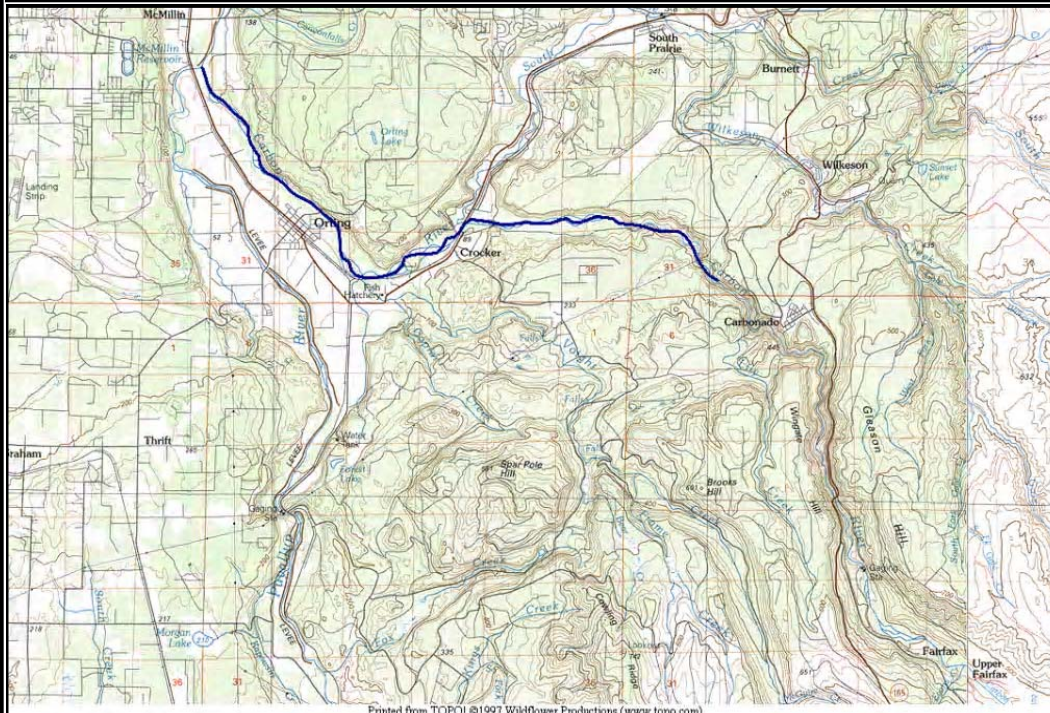
CANYONFALLS CREEK CHUM SEASONAL COMPARISONS (2001 - 2004)



CARBON RIVER

WRIA: 10.0413 - PUYALLUP RIVER

2004 - 2005



River miles surveyed:
0.0 to 8.5

Dates surveyed:
9/2/04 to 5/23/05

Species surveyed:
Chinook, Coho, Pink,
Chum, Steelhead

Access

R.M. 8.5: Take Hwy.
162 through Orting.

Turn on 177th St,
follow approximately 2
miles to end. Put-in
suitable for raft only.

R.M. 0.0: Take Hwy.
162 and turn East on
128th Street. Turn
South on McCutcheon
road and then West at
the first driveway,
Known as the "Dollar
launch".

DESCRIPTION

The Carbon River is a major tributary of the Puyallup River, entering the Puyallup at RM 17.9. The Carbon River provides excellent spawning and rearing opportunities for salmon and steelhead. In the past, steelhead have been documented as high as the Mt. Rainier National Park boundary. However, the majority of the spawning for all species occurs in the lower 11 miles. The lower 3 miles of the Carbon River are constrained by earthen dikes. The channel varies considerably in width, but averages approximately 300 ft. The resulting channel is only moderately diverse with a pool riffle character. Spawning gravel exists in limited quantities and is utilized by all species of salmonids present, although not in the numbers observed in the upper reaches.

From the mouth of South Prairie creek at RM 6.0, downstream to RM 3.0, the river is only leveed along the South Side. There are large natural bluffs to the north and the river is able to migrate over a channel of up to 0.5 miles wide. This reach contains multiple channels and many woody debris jams throughout its length. The spawning and rearing habitat is excellent here and the highest spawning densities of all species are observed along this stretch of river.



The reach above South Prairie creek from RM 6.0 to 8.5 is again constrained by both dikes and bluffs on the North side. This reach has a slightly higher gradient than the lower river and as a result contains less spawning habitat. There are portions that are utilized by chinook and steelhead but, not in the densities observed in the reach above Voights creek.

Above RM 8.5 the Carbon River flows through a narrow canyon for several miles before becoming unconstrained below the Mt. Rainier National Park boundary. This canyon reach supports both chinook and steelhead spawning. Chum and pink salmon have not been observed above RM 8.0

The Mt. Rainier National Park boundary is located at RM 23. Up to approximately RM 26 the gradient remains low enough to provide some spawning opportunities in channel margins and pool tailouts. Several small and moderate debris jams occur throughout this reach. Above this, the gradient gradually increases to the terminus of the Carbon glacier. There is less braiding in this section and the substrate is considerably larger providing few if any spawning opportunities.

Winter steelhead stocks have been in serious decline for the past several years. Tribal and state fisheries managers are currently working on a recovery plan to improve future steelhead returns and hope to implement this plan in early 2006. Continuing efforts are being made by the tribe and WDFW to increase and expand the survey coverage area in order to improve escapement estimates. During the 2005 steelhead survey season, WDFW and Puyallup Tribe fisheries staff increased the survey coverage along the Carbon by making regular helicopter surveys of the river from the NPS boundary at RM 23, to its confluence with the Puyallup River. Additional foot surveys were also conducted from RM 8.5 to RM 11.5. The result of the surveys was disappointing, only 5 additional redds were observed above the regular surveyed section from RM 0 to RM 8.5.



Upper Carbon river near the boarder of Mt. Rainier National Park RM 23 (right of bridge). This picture shows the large active, and braided channel of the upper river.

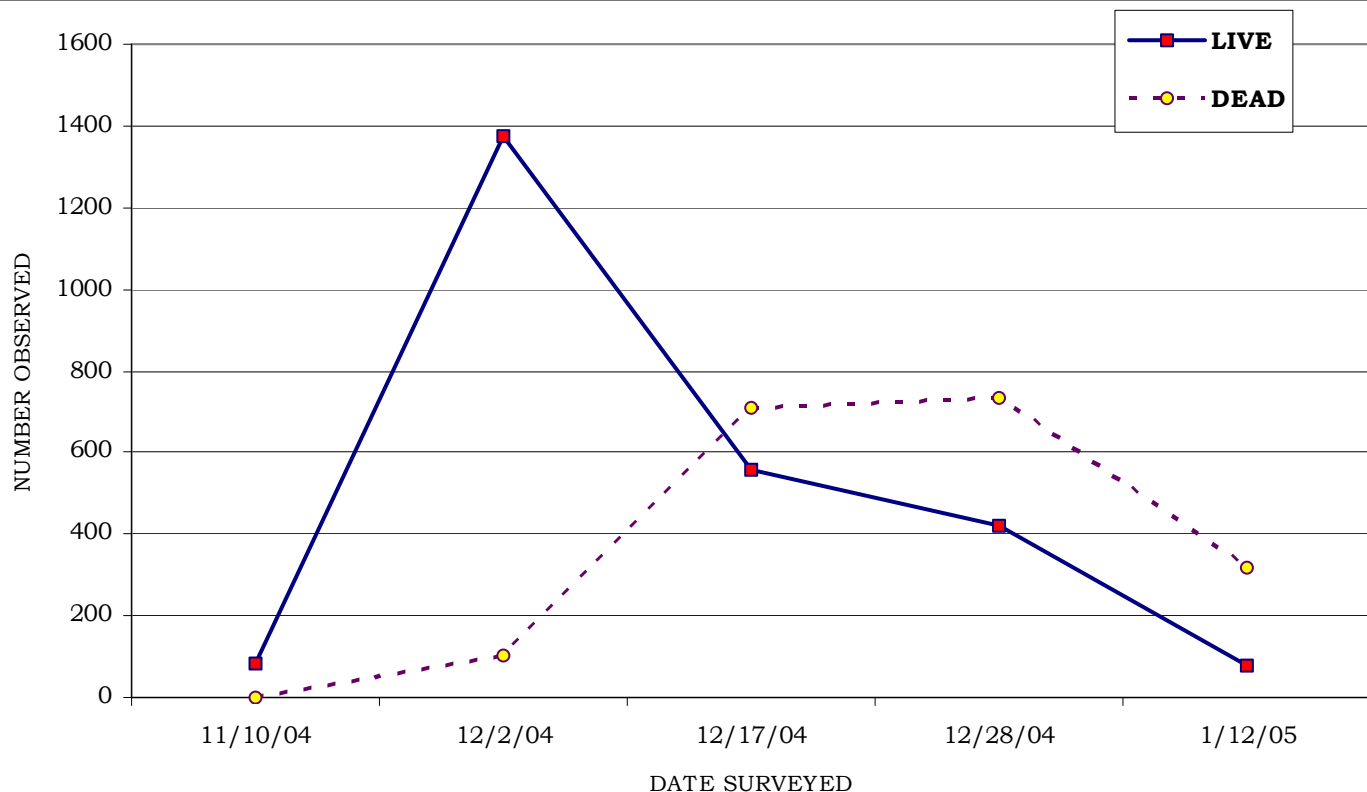
From the mouth of South Prairie creek at RM 6.0, downstream to RM 3.0, the river is only leveed along the South Side (below). There are large natural bluffs to the north and the river is able to migrate over a channel of up to 0.5 miles wide.



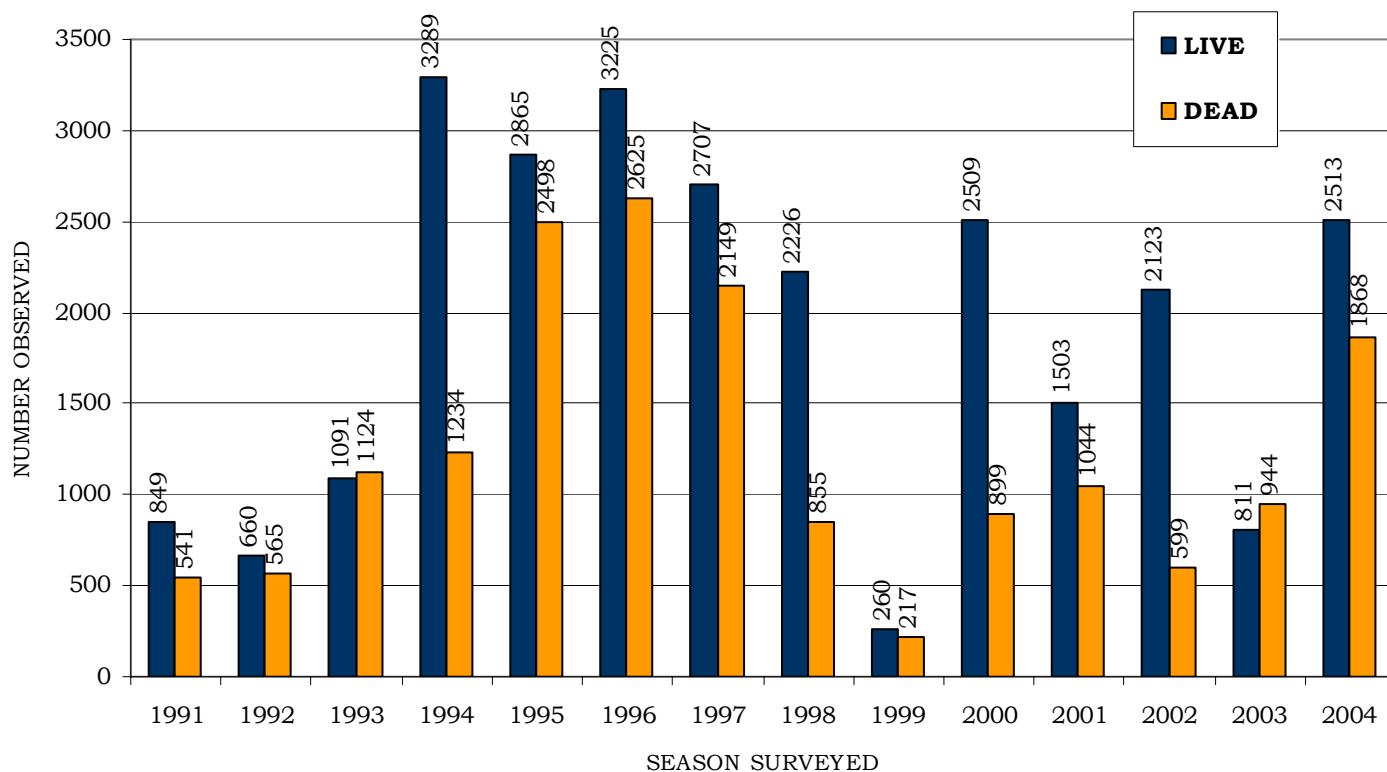
A number of side channels are utilized heavily by chum salmon along the carbon river. Most of the chum spawning occurs below South Prairie creek.



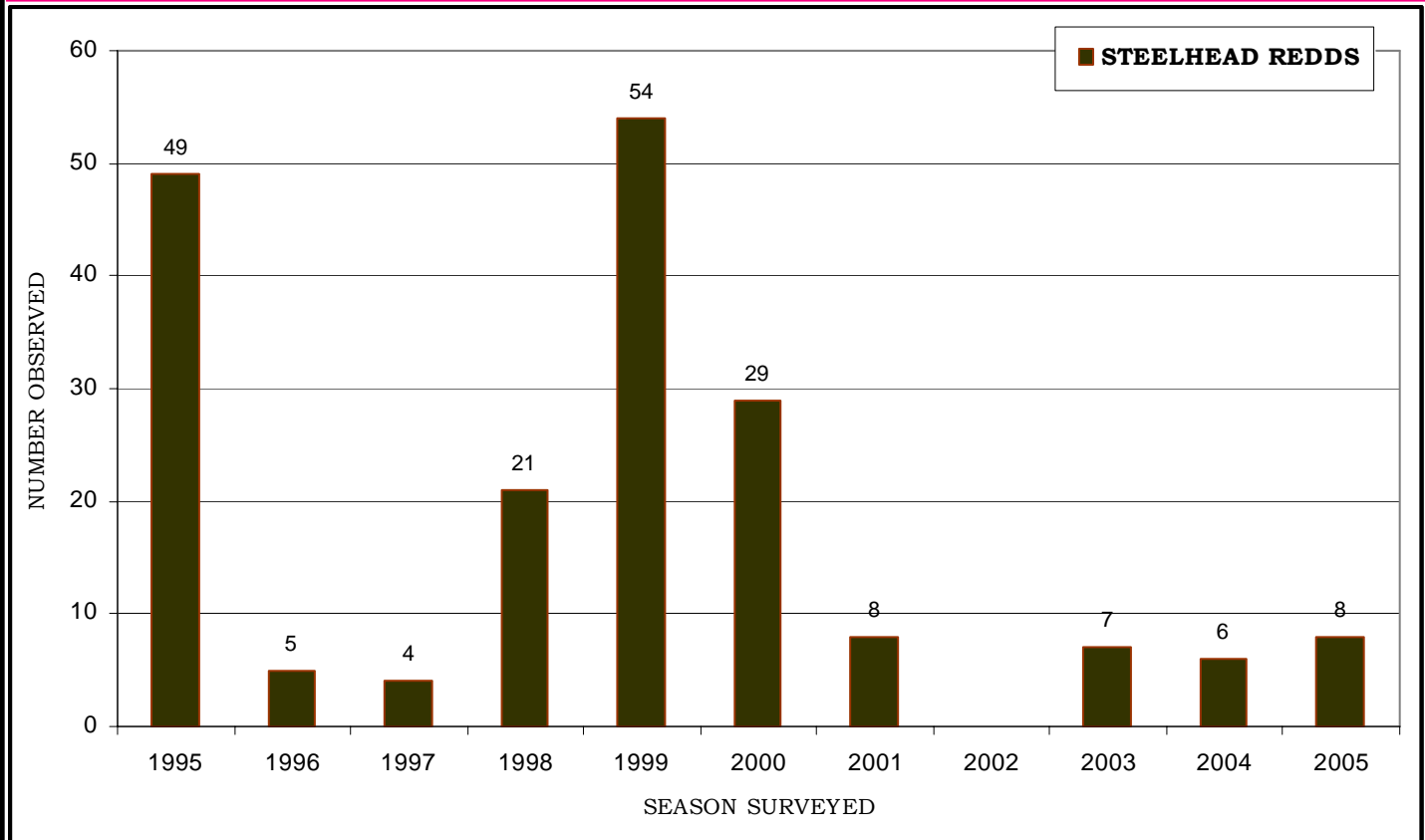
2004 CARBON RIVER CHUM COUNTS



CARBON RIVER CHUM SEASON COMPARISONS (1991 - 2004)



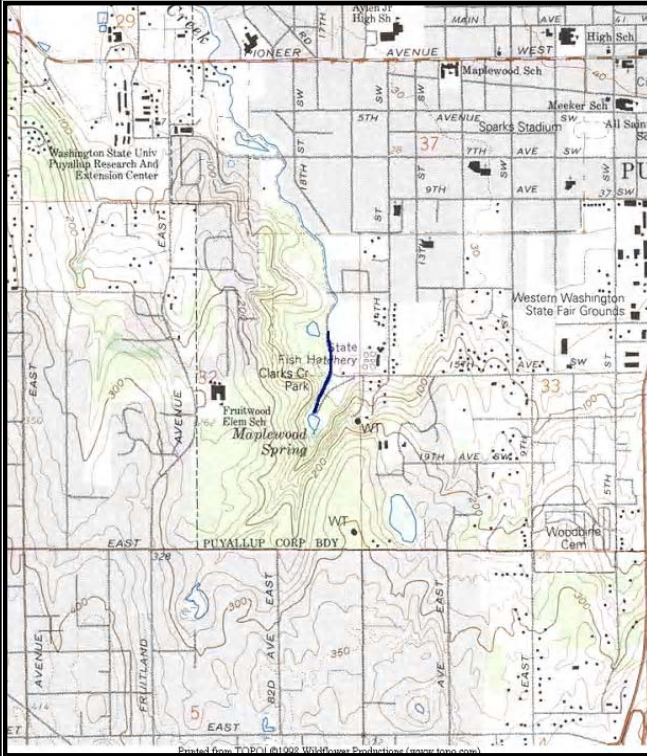
CARBON RIVER STEELHEAD SEASON COMPARISONS (1995 - 2005)



CLARKS CREEK

WRIA: 10.0027 - PUYALLUP RIVER

2004 - 2005



Chum salmon spawning in the upper extent of Clark's creek.

DESCRIPTION

Clark's creek is a tributary to the Puyallup River, entering the Puyallup at RM 5.8. Clark's has two small tributaries; Diru and Rody creeks. Clark's is a low gradient spring-fed stream with a pool-riffle character. Salmonberry, maple and alder dominate the riparian zone. The upper extent of the

Clark's creek (RM 3.4 to 3.7) provides abundant spawning opportunities for all species. The remaining stream below the survey reach contains little gravel and the substrate consists of fine sand and mud. Little or no spawning has been observed below RM 3.4. Upstream fish migration is blocked by a dam at RM 3.7. The Washington Department of Fish and Wildlife (WDFW) operates a fish hatchery at the headwaters of Clark's. The state hatchery raises trout for stocking local lakes. Gravel was introduced into the channel from RM 3.5 to 3.7 in the fall of 1997 and again in the summer of 1999. This greatly enhances the spawning opportunities for chinook, coho and chum salmon. However, increased spawning densities have resulted in a high amount of redd superimposition throughout this short reach. Several log weirs have been placed above the interpretive bridge to aid in gravel retention.

The Puyallup tribe completed construction of a chinook salmon hatchery on Clark's creek (RM 1.0) in the spring of 2004. The hatchery was constructed in order to address several fish management issues, one of which includes minimizing the straying of adult fall chinook reared by the tribe and released from Diru creek. Extremely low summer flows in Diru creek prevent adult chinook from returning to the hatchery.

River miles surveyed: 3.4 to 3.7

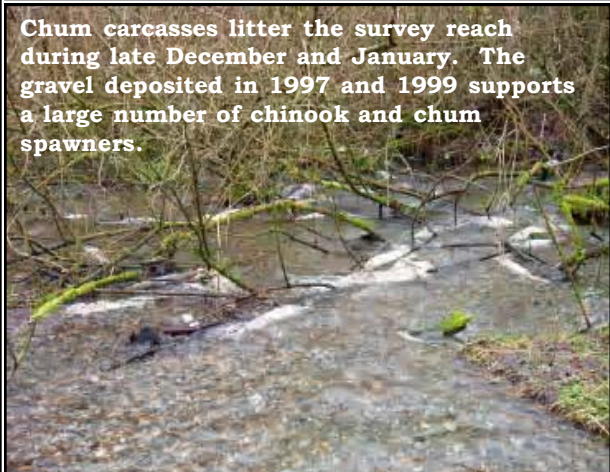
Dates surveyed: 8/16/04 to 5/23/05

Species surveyed: Chinook, Coho, Chum, Steelhead (N/O)

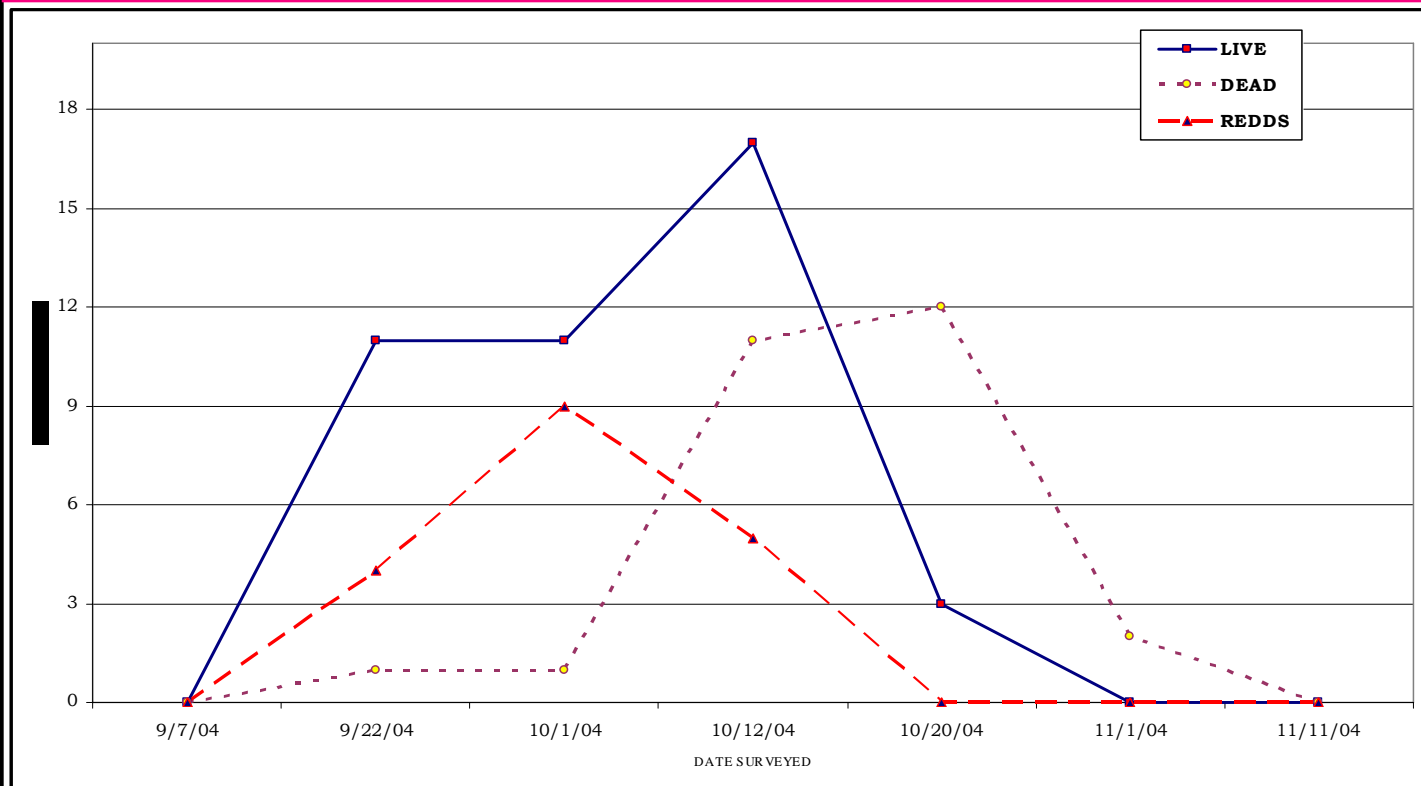
Access

Mile 3.4: From W. Pioneer Avenue, turn south on 14th St. S.W. Drive to a sharp right turn in the road and there is a WDFW hatchery on your right. Turn right on 15th Avenue just past the hatchery and park at the gate. Be sure to let the hatchery staff know you intend to walk

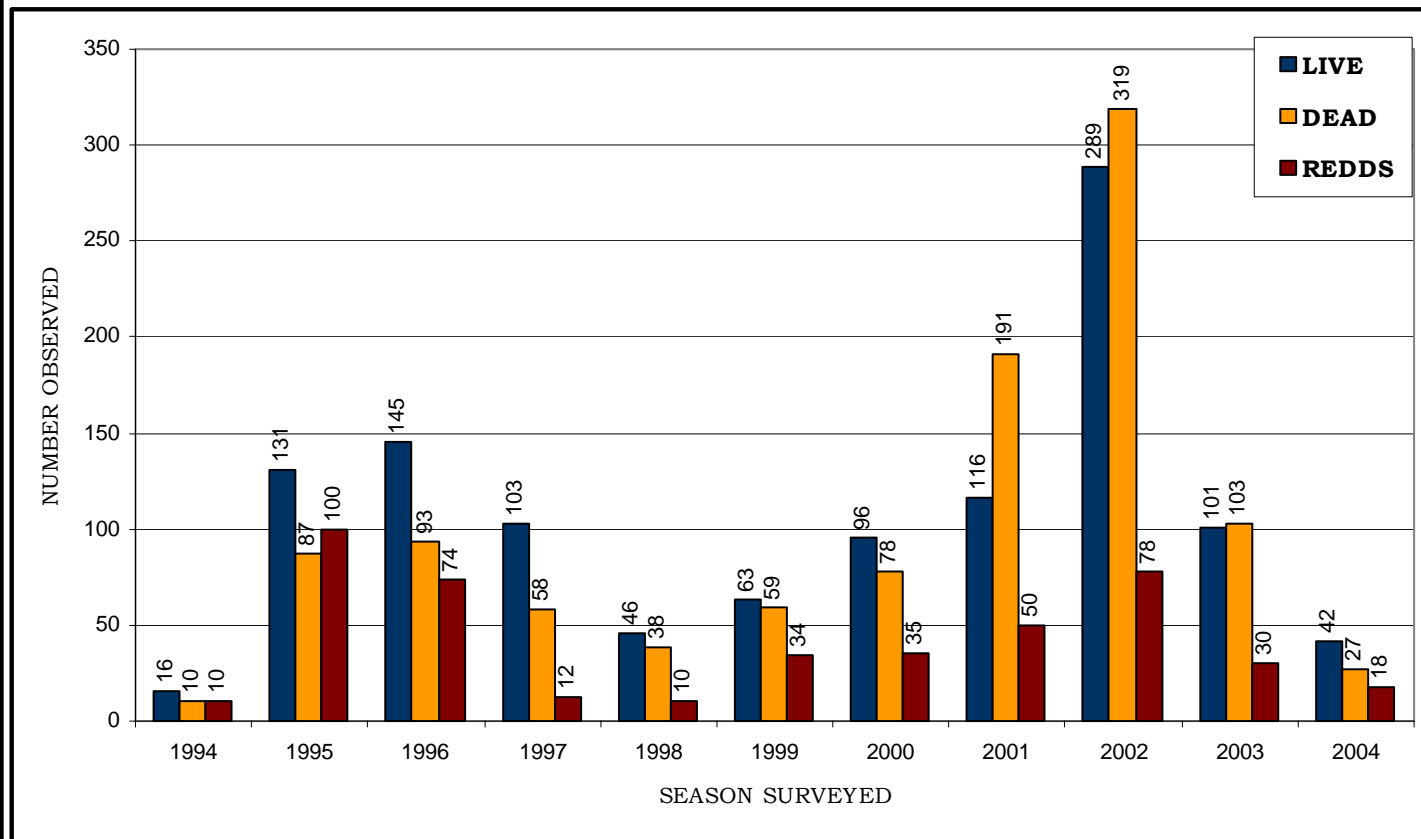
Chum carcasses litter the survey reach during late December and January. The gravel deposited in 1997 and 1999 supports a large number of chinook and chum spawners.



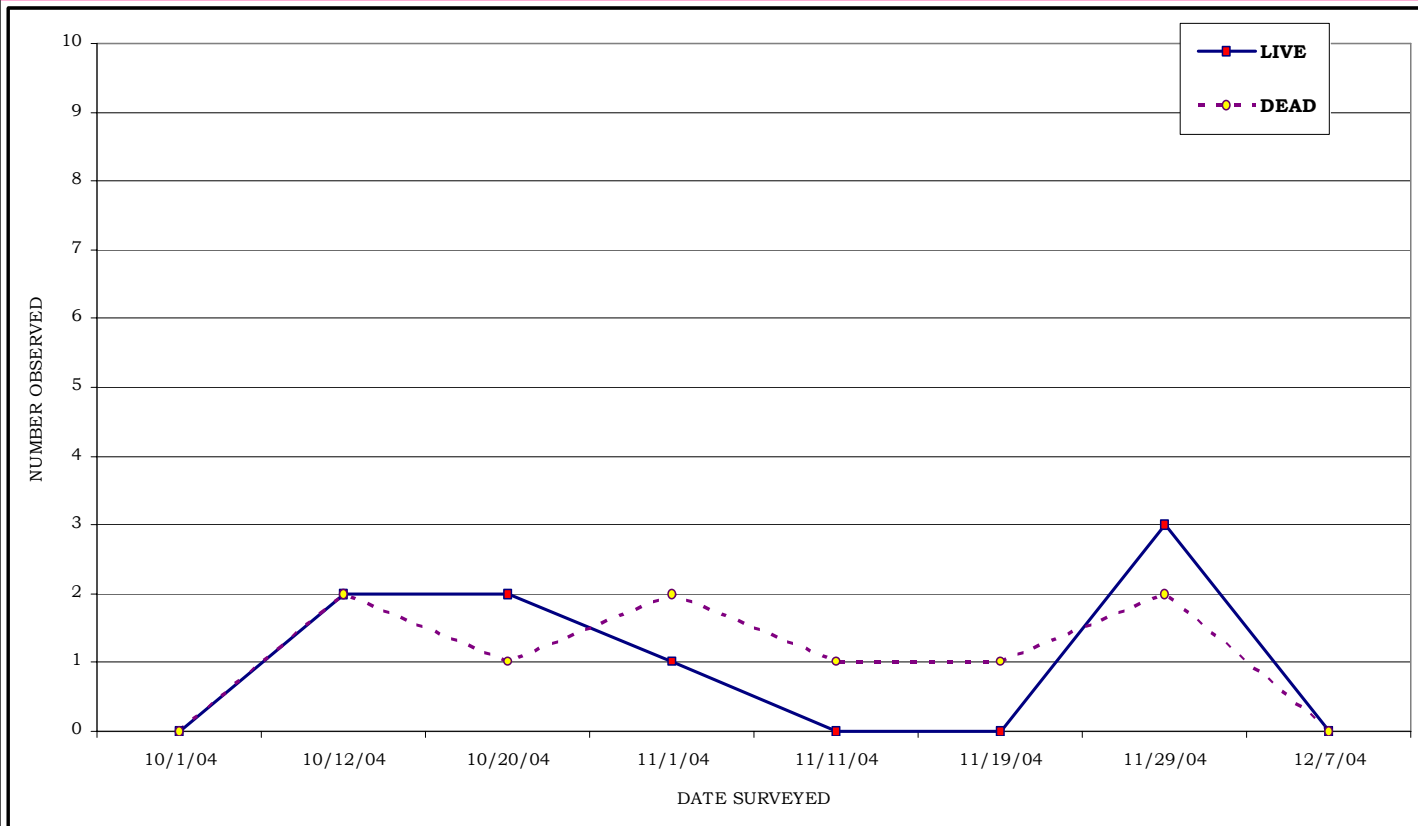
2004 CLARKS CREEK CHINOOK COUNTS



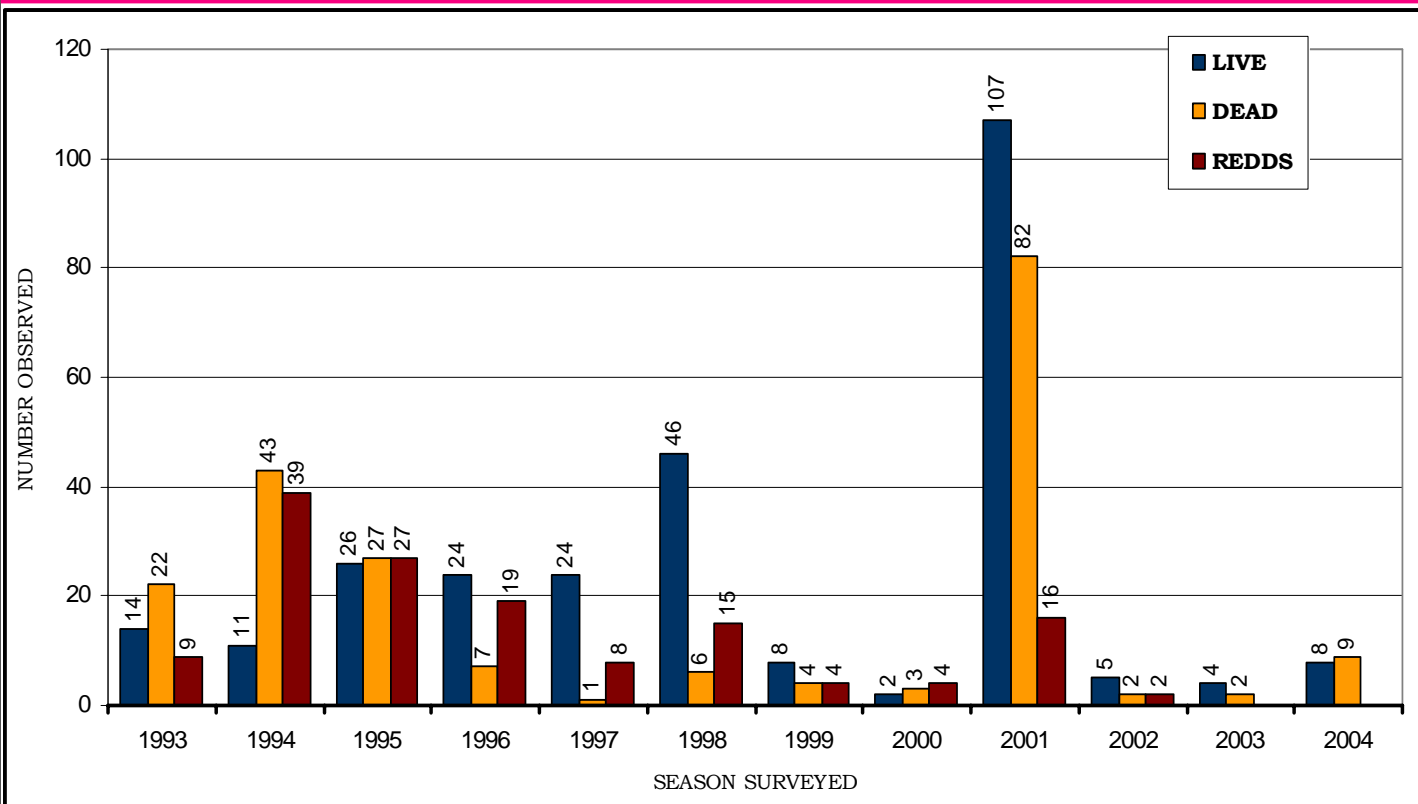
CLARKS CREEK CHINOOK SEASON COMPARISONS (1994 - 2004)



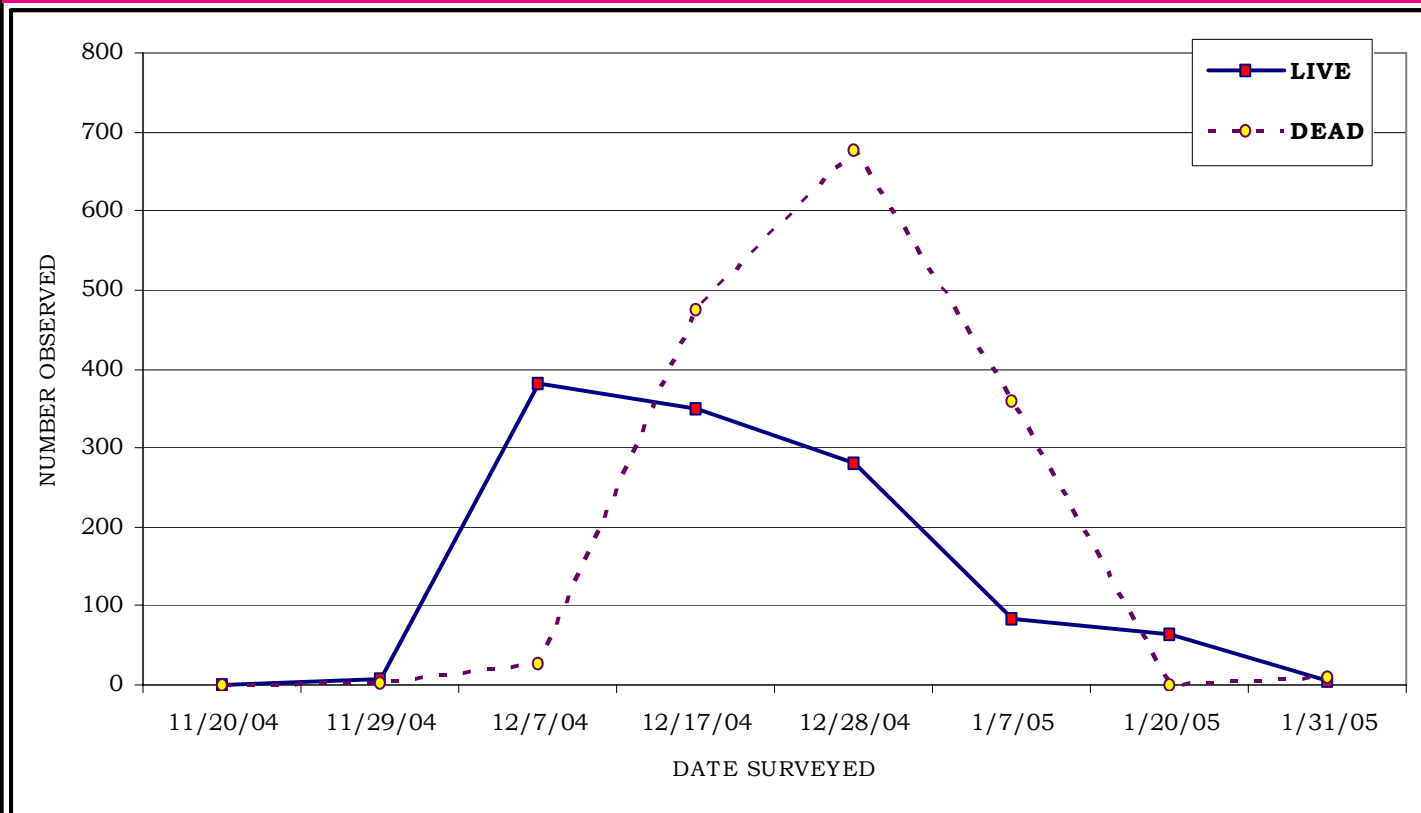
2004 CLARKS CREEK COHO COUNTS



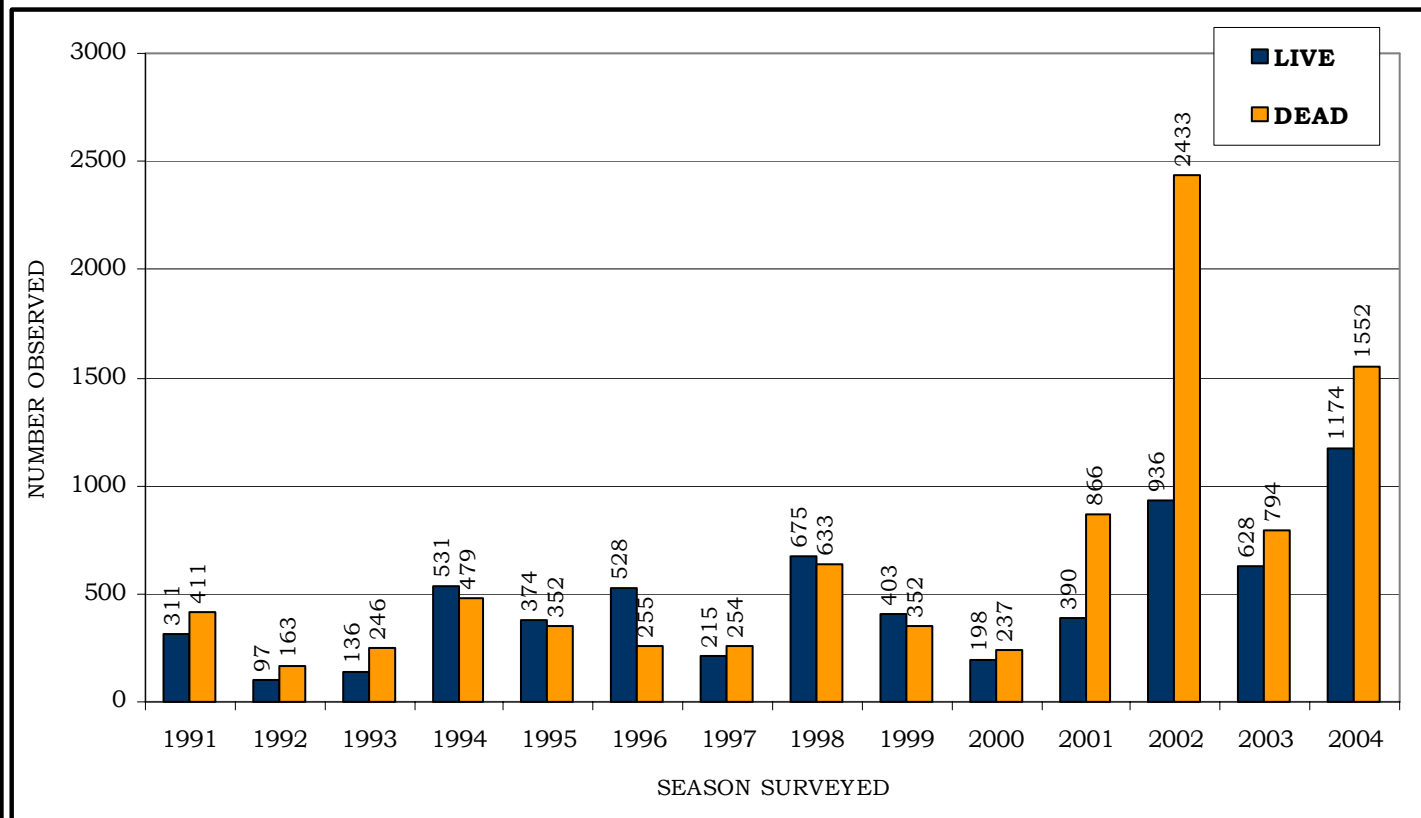
CLARKS CREEK COHO SEASON COMPARISONS (1993 - 2004)



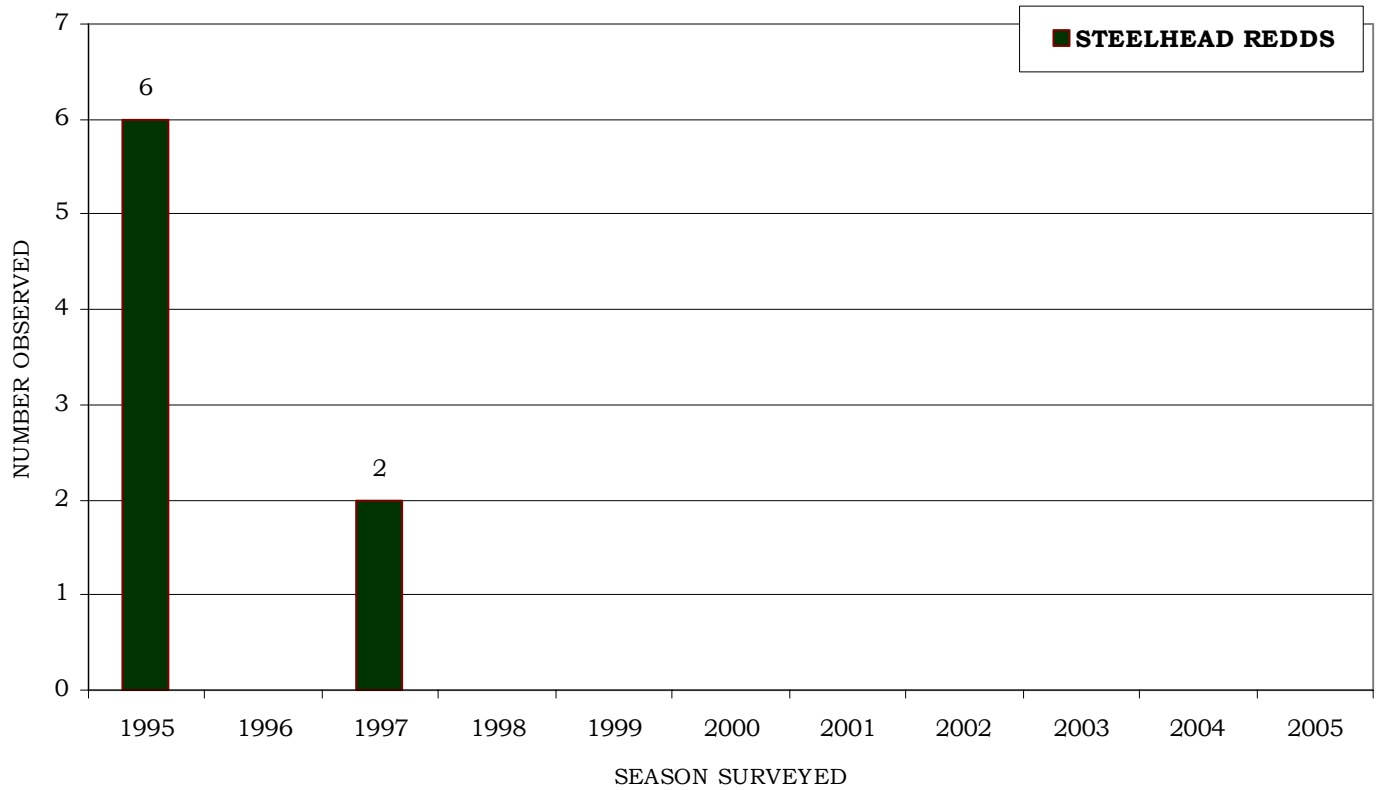
2004 CLARKS CREEK CHUM COUNTS



CLARKS CREEK CHUM SEASON COMPARISONS (1991 - 2004)



CLARKS CREEK STEELHEAD SEASON COMPARISONS (1995 - 2005)



PUYALLUP TRIBE OF INDIANS CLARKS CREEK SALMON HATCHERY

WRIA: 10.0027 - PUYALLUP RIVER

2004 - 2005

Puyallup Tribe Fish Hatchery Facility
River mile: 1.0
Species: Fall And Spring Chinook

DESCRIPTION

The Puyallup Tribe of Indians Clarks Creek Salmon Hatchery is located at RM 1 on Clarks Creek (10.0027), a tributary to the Puyallup River. The Clarks creek hatchery was constructed



in order to address several fish management, and water supply issues including; minimizing the straying of adult fall chinook reared by the tribe; providing space for rearing and acclimating White River spring chinook; creating an independent and self sustaining fall and spring chinook program for the tribe, and providing a reliable water supply to rear and expand fish production.

Water is supplied from five vertical turbine pumps, each 20-horsepower. Each pump has a flow capacity of 1,600 gpm. Each pump is capable of supplying one of four ponds with approximately 3.6 cfs. Each of the four ponds has approximately 12,000+ cubic feet of water volume, two ponds are concrete lined and designed to hold adult and juveniles, while the other two are natural acclimation ponds (bottom).

In addition, the Puyallup Tribe operates seven acclimation ponds in the Puyallup Watershed. Three of the acclimation ponds are used for reintroducing fall chinook and coho into a 30-mile reach in the Upper Puyallup River above Electron Dam. The Electron Diversion Dam had been an anadromous barrier for 97 years. A fish ladder was construction and completed in fall of 2000. Four other acclimation ponds are located in the Upper White River

drainage. These ponds are used for reintroducing White River spring chinook back into their endemic range. All ponds have approximately 10,000 cubic feet of rearing space and between 1 to 3 cubic feet per second flow.

The Puyallup Tribe's restoration goal is to rebuild depressed chinook stocks and remove them from ESA listing. Using acclimation ponds, limiting harvest, and making substantial gains in habitat restoration, the tribe will be able to accomplish this task. Levee setbacks, oxbow reconnections both

Planting the first juvenile fall chinook into one of the natural acclimation ponds (Spring 2004).



inter tidal and upland, Commencement Bay cleanup, and harvest cutbacks have already been initiated. Only the jump-starting of chinook in habitat areas devoid of fish has remained one of our biggest challenges. Acclimation ponds are a proven method in increasing fish numbers on the spawning grounds. Hatchery rearing 200,000 fall chinook for release on station and 200,000 for acclimation ponds in the upper Puyallup River for a combined 6,857 pounds of fish. Historically, fall chinook have been reared since 1980 with a variety of stocks, goals, and objectives.

Spring Chinook Hatchery Production

The four-acclimation ponds the Puyallup Tribe operates are satellite facilities to the White River and Minter Creek Hatcheries. The acclimation ponds are located in the upper White River watershed on the Clearwater River, Cripple and Huckleberry creeks.

Production levels hover around 400,000+ smolts, however, numbers fluctuates based on available brood stock. They have a rearing capacity of approximately 837,000 zero age smolts.

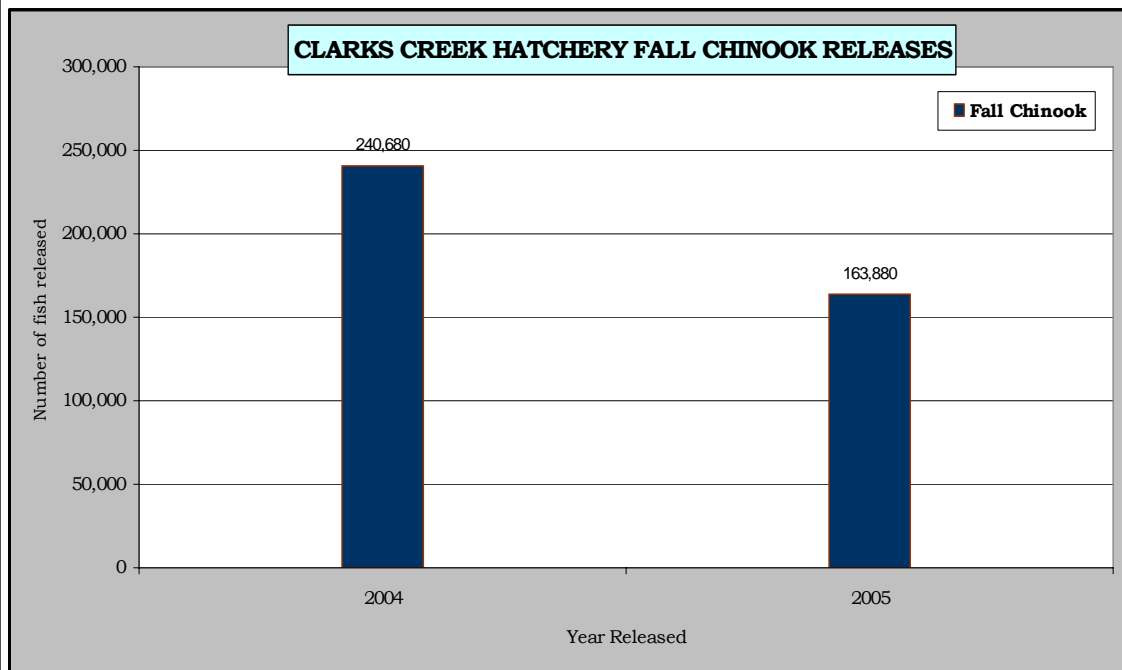
Current Fall Chinook Hatchery Production

In 2004, the Puyallup tribal fisheries department began acclimating and releasing fall chinook from the Clarks creek facility, discontinuing all chinook releases from the Diru creek hatchery. In early 2005, construction of a new incubation building was completed at Clarks creek. The incubation building houses 32 incubator stack, each capable of holding up to 77,000 chinook eggs, for a total capacity of approximately 2.5 million eggs. Once fish are ready to be moved from the incubators, they can be place in one of the 16 aluminum raceway-troughs and hand feeding can begin. The troughs are 16 feet in length with a flow rate of up to 25 gpm. When the fish are approximately 500/lbs., they are transferred to one of the cement lined



Each of the four ponds at the hatchery holds approximately 12,000+ cubic feet of water. This photo shows juvenile chinook being planted into one of the two concrete lined ponds designed to hold adult and juveniles. Once the juvenile chinook have been massed marked, they are transferred to one of the natural acclimation ponds.

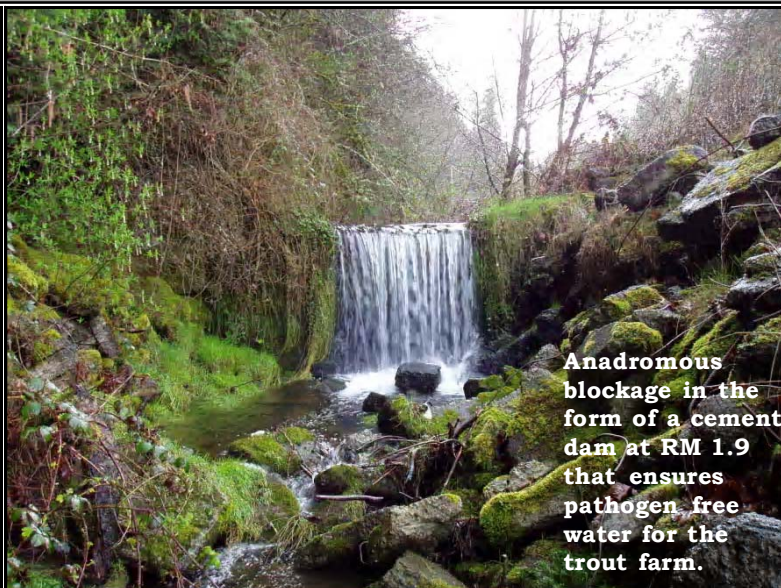
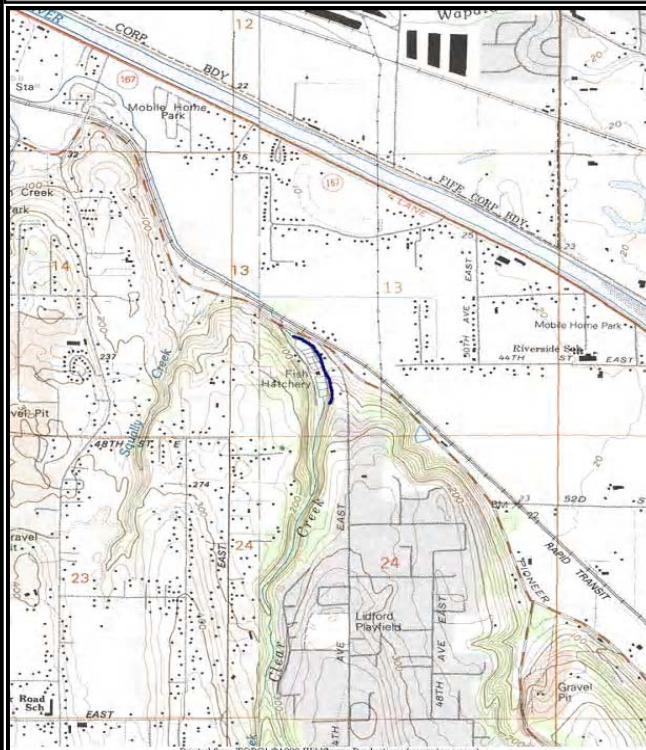
ponds. Holding the chinook in the cement pond is only temporary until they are up to a large enough size, usually in late April, to be massed marked via a automated tagger. Once tagged, the fish are planted in one of the two natural acclimation ponds until they are released in late May or early June.



CLEAR CREEK

WRIA: 10.0022 - PUYALLUP RIVER

2004 - 2005



Anadromous blockage in the form of a cement dam at RM 1.9 that ensures pathogen free water for the trout farm.

DESCRIPTION

Clear creek is a tributary to the Puyallup River, converging with the Puyallup at RM 2.9. Clear creek flows as a moderate gradient pool-riffle stream above Pioneer Way before paralleling the road for several hundred feet. The upper reach has good spawning gravel from RM 1.7 to 1.9. Although the riparian area is not intact, there are undercut banks and moderate amounts of in-stream cover. A high density of canary reed grass and other vegetation chokes approximately 100 meters of the channel every summer, trapping a lot of fine sediment which covers the available spawning gravel by several inches. The vegetative growth and the lack of water though this reach, often prevent chinook from accessing and spawning successfully. There is an anadromous blockage in the form of a cement dam at RM 1.9 that ensures pathogen free water for hatchery raised rainbow trout at the Troutlodge facility, a private trout farm. The reach above the dam has not been surveyed. Large numbers of chum spawn (above and left) each year in the 0.2 miles of available habitat below the man made dam at RM 1.9. Over 1000 live chum were observed during the 2004 season, making it the highest return since surveys began in 1994. Relatively few, if any coho or steelhead are observed in this segment of the creek.

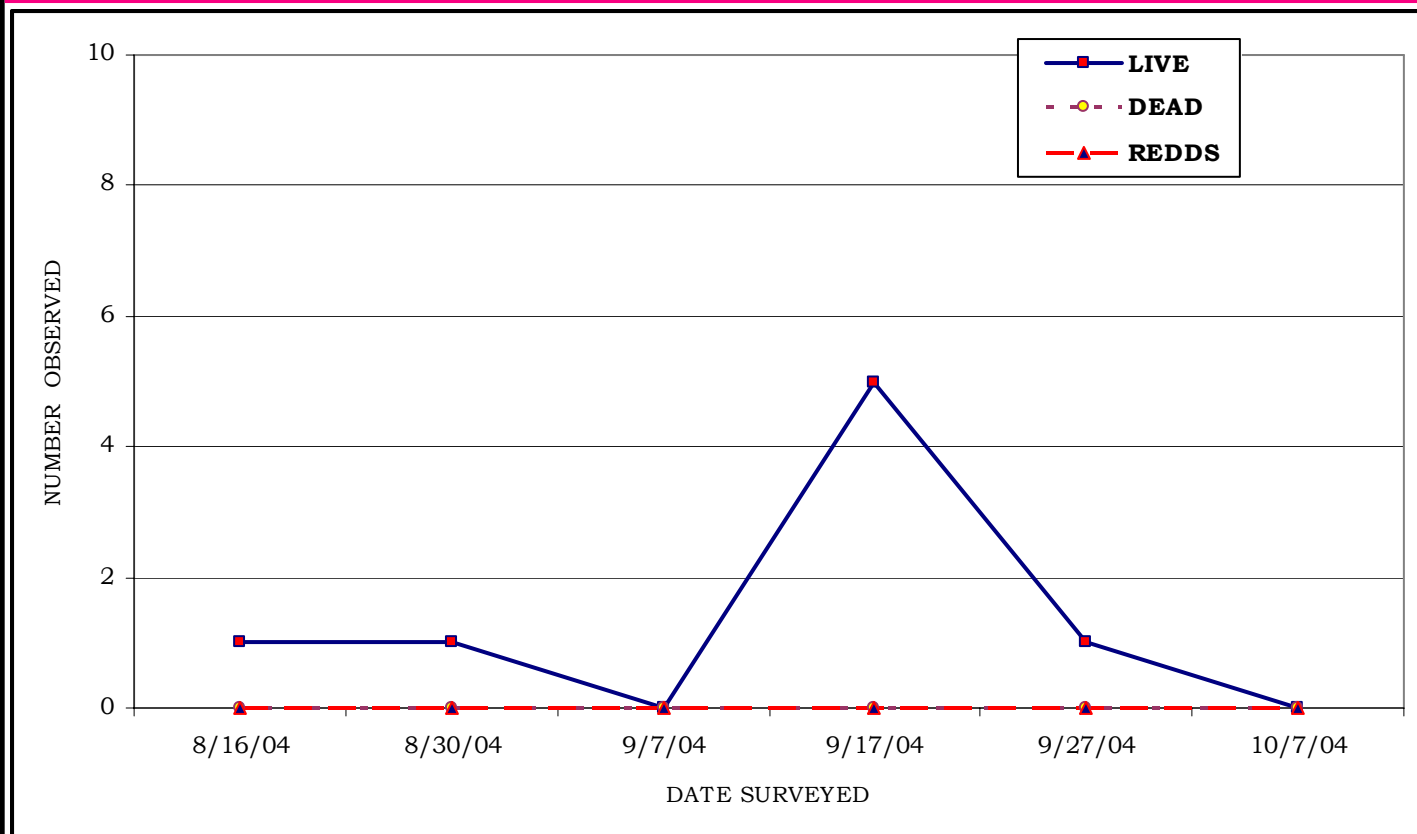
River miles surveyed: 1.7 to 1.9
Dates surveyed: 8/16/04 to 2/10/05
Species surveyed: Chinook, Coho N/O Chum

Access

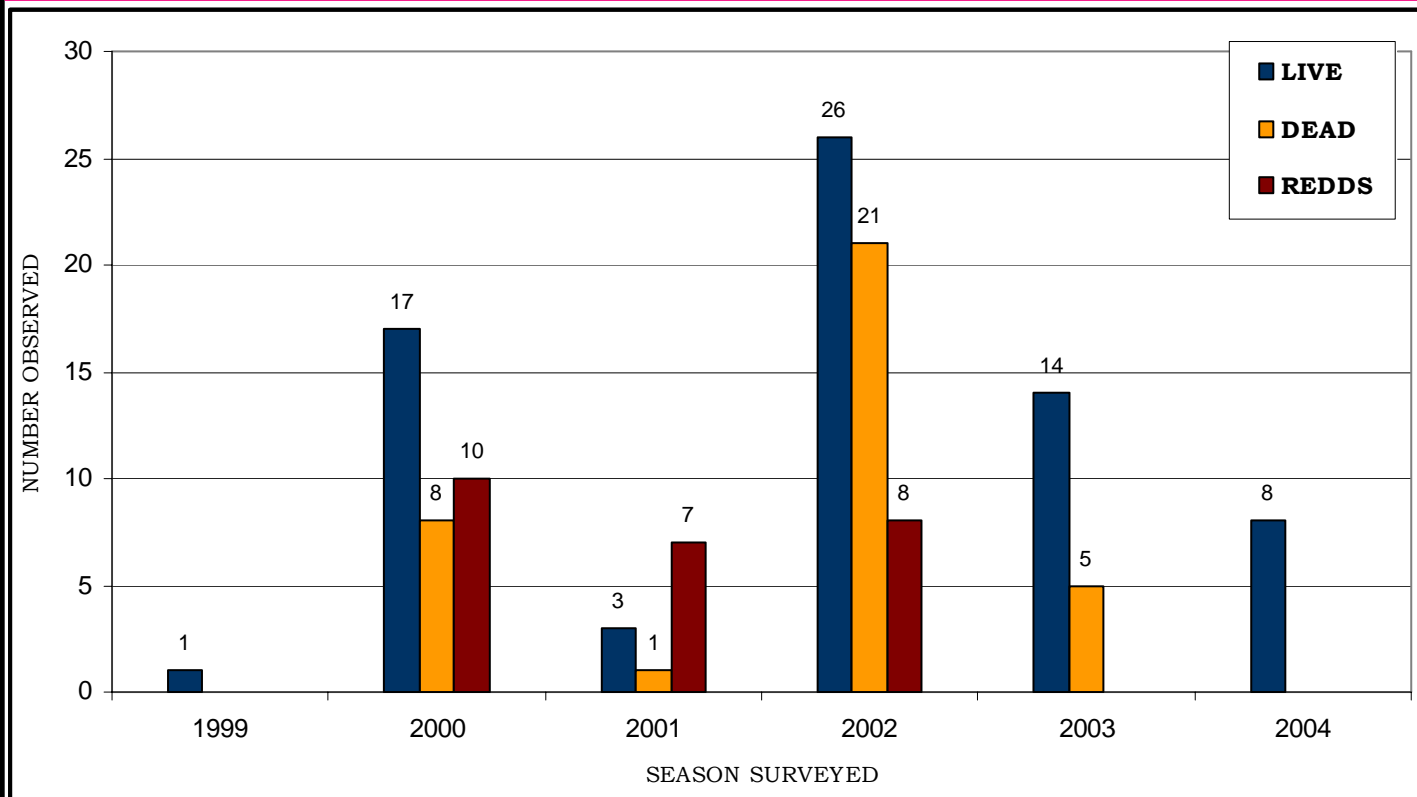
Mile 1.7: Clear creek crosses Pioneer Way at the Troutlodge facility, a private trout farm. The survey begins where the stream curves to the North away from the road and ends at an artificial dam. **Ed Mcleary, of Trout lodge, has requested that surveyors remain in the stream channel and contact him prior to surveying the site. He can be reached**



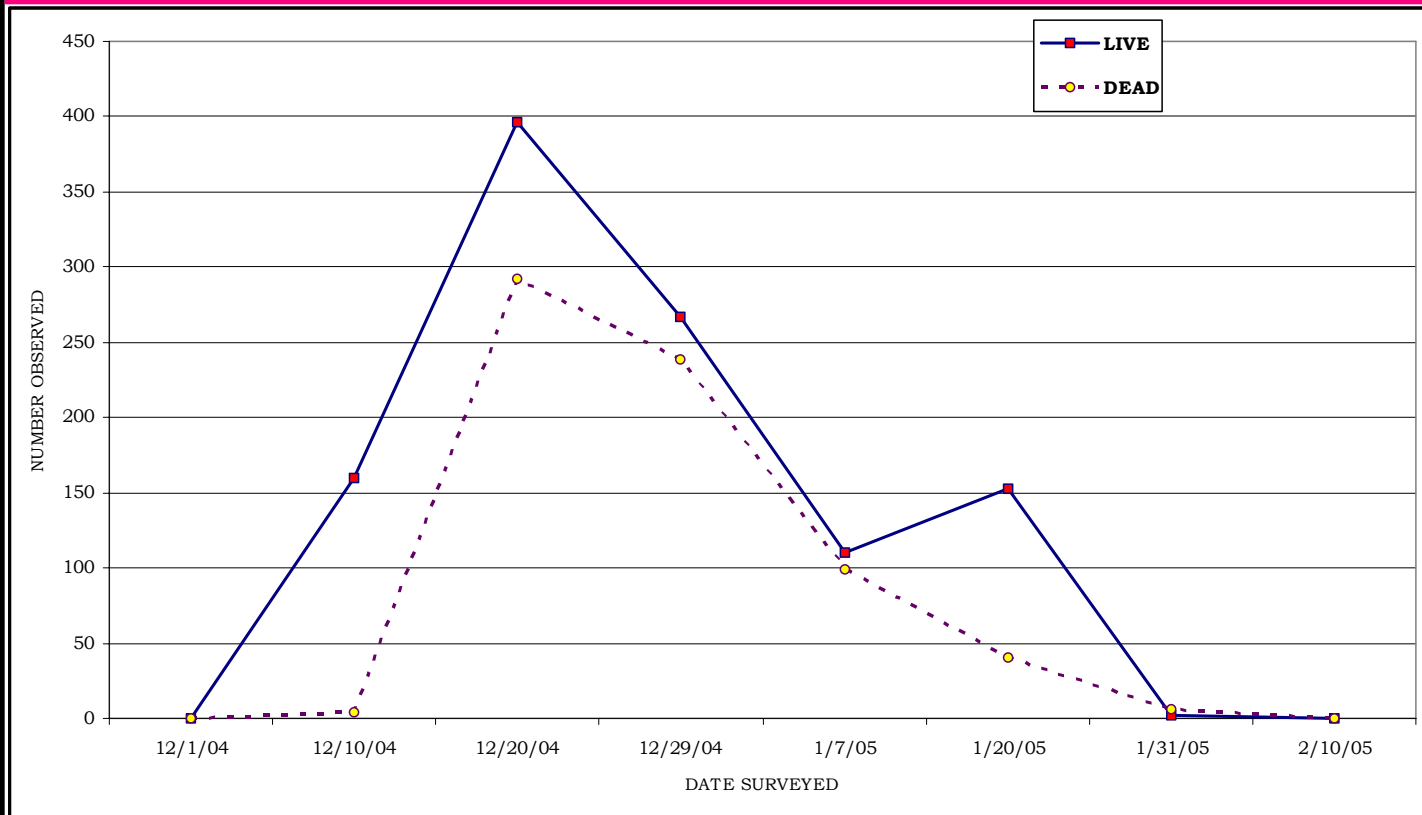
2004 CLEAR CREEK CHINOOK COUNTS



CLEAR CREEK CHINOOK SEASON COMPARISONS (1999 - 2004)



2004 CLEAR CREEK CHUM COUNTS



CLEAR CREEK CHUM SEASON COMPARISONS (1994 - 2004)

